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ABSTRACT

The rapid expansion of many branches of education in most of the 22-member countries of the Organisation for Economic Cooperation and Development has rarely been accurately forecast. The most important overall objective of educational policy during the decade has been (1) educational opportunity for all and (2) equalization of educational opportunity. This expansion appears to stem from the so-called social demand approach to educational planning, which claims that places should be provided by the public in all branches of education for all children who seek them and who have proved that they have the requisite abilities to benefit from courses in the particular branch of education in which a place is sought. Although it was assumed that rapid expansion of educational opportunity for all would accrue from this approach, the policy actually contains an antiegalitarian bias in favor of middle class children. Both the inputs (resources) and the outputs of the educational systems have increased enormously during the past decade despite partially conflicting manpower and efficiency considerations. A radically new approach to the problem of relating forecasting, planning, and policymaking appears needed for the educational systems in question. Related documents are ED 057 470 and EA 004 420-425. (Author/JH)

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Background Study No. 5

EDUCATIONAL POLICIES, PLANS AND FORECASTS DURING THE
NINETEEN-SIXTIES AND SEVENTIES

The attached report, written by Gareth L. Williams, is one of a series of Background Studies prepared by the Secretariat for the Conference on Policies for Educational Growth. Its subject is closely related to that of Background Study No. 8, on "Educational Planning Methods", and Background Study No. 9, on "The Role of Analysis in Educational Planning".

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EDUCATIONAL POLICIES, PLANS AND FORECASTS DURING THE NINETEEN-SIXTIES AND SEVENTIES

Summary

Educational objectives

This paper presents evidence which suggests that the rapid expansion of many branches of education in most Member countries has rarely been accurately forecast. In general, policies have evolved as the outcome of ad hoc decisions taken in response to situations with an internal dynamic of their own.

No attempt is made to cover more than a small part of the vast number of educational planning activities and policy decisions that have been taken in twenty-two Member countries over a period of ten years. Rather the paper seeks to identify some of the most important criteria which have governed educational policies during the decade, and relates these to forecasting and planning techniques.

By far the most important overall objective of educational policy during the decade has been expansion. This has broadly had two points of focus: the expansion of educational opportunity for all and the equalisation of educational opportunity. Common measures taken to meet these objectives have been the lengthening of the period of compulsory education, the expansion of post-secondary and higher education, a very much increased provision of scholarships and other forms of financial support in higher education, and a movement towards the abolition of selective schools in lower secondary education. Most O.E.C.D. countries have increased their period of compulsory education by 1 or 2 years since 1960 and few now have less than 8 years compulsory education and most have 10. Expansion of numbers in post-compulsory education has been rapid, due partly to the rise in numbers in the relevant age groups but even more to the increasing proportion of each age group staying on beyond the minimum school-leaving age. Between 1955 and 1965 enrolment in upper secondary education more than doubled in nearly all Member countries. In most countries an increase of at least 7 per cent per year in the number of students in higher education has been accepted as normal. These trends are continuing.

The objective of providing equal educational opportunity has proved more elusive: although progress has been made, the inequalities have persisted and the best that most countries can claim is partial success in achieving more equal participation among different social groups. Even in systems with high rates of participation in upper secondary and higher education, such as those of the United States and Japan, marked class disparities

persist and, especially in the United States, regional and ethnic differences in participation rates have recently been given considerable publicity. Further, systems that have recently reported dramatic increases in enrolments (France, Netherlands, Sweden, United Kingdom), and explicit educational policies to reduce disparities, have found these disparities to be very tenacious. (1)

The basis of the expansion has for the most part the so-called social demand approach to educational planning: which claims broadly speaking that places in all branches of education should be provided by the public authorities for all children who seek them and who have proved that they have the requisite ability to benefit from courses in the particular branch of education in which a place is sought. It was assumed that this interpretation of public authority responsibility would lead to a rapid expansion of educational opportunity for all, and it is only recently that the anti-egalitarian bias in such a policy criterion has come to be realised. Put brutally, the policy falls down because of the ignorance of people in many social groups about the range of educational opportunities potentially available for their children. The result has been that an increasing proportion of the available resources has been devoted to upper secondary and higher education as the mainly middle class children who succeed in the lower levels of education demonstrate their ability to progress to higher levels. Only recently has it begun to be realised that if equality of opportunity is to be a real objective of the educational system it is necessary to begin to exert "positive discrimination" in favour of disadvantaged social groups from early childhood.

Besides expansion in response to "social demand", the other two principal stated objectives of educational systems during the past ten years have been to be relevant to the needs of economic growth and to be efficient. Despite the popularity of these two criteria in the literature of educational planning, they appear not to have been nearly so important in actual educational decisions as social demand considerations. Certainly, some specific examples can be given where a manpower forecast has led to a decision to expand or contract a particular university faculty, usually medical or engineering, but in general the effect of the enormous development of manpower forecasting has merely been to convince public opinion that there are shortages of qualified manpower, particularly below the top educational levels and particularly in the areas of science and technology. Despite these findings, however, students have insisted on obtaining more and more education up to the highest levels, and in most countries there has been a marked "swing from science" in upper secondary and

(1) Taken from Development of Secondary Education - Trends and Implications, O.E.C.D. 1969.

higher education. Parallel systems of vocational and technical upper secondary education have in general been failures in that they have been considered very much second best by students. Manpower forecasts have been used to try to influence social demand; where they have failed to do so stronger measures have rarely been tried.

This failure of students to follow courses of study which manpower forecasts indicate are needed leads to some important questions about students' own perceptions of why they are seeking education and how they effectively choose courses of study. Research on these topics has hardly begun in most countries.

Educational planners as opposed to educationists have rarely been concerned with curricula development. However, there appears to have been an interesting parallel with the quantitative educational planning being discussed here. In some countries, curricula have changed radically during the past ten years. However, such changes appear to have evolved largely from developments of knowledge about a subject, particularly at the higher levels, and changes in educational theory, especially at the lower levels. Rarely can curriculum developments be related directly to changing social, economic and political needs.

The other important general educational objective has been increased efficiency which means more output with the same amount of inputs. This objective has not been achieved. While the output of educational systems whether measured in student numbers or graduates has increased enormously, the main inputs (mainly teachers) and the money expenditure which measures them have for the most part grown equally rapidly. There has probably never been a decade when finance for education, particularly higher education, has been so forthcoming in so many countries. It may be claimed that this was a triumph for the economists who persuaded policy-makers that educational expenditures should be considered investments. There are increasing fears that these years of plenty will be followed by a period of relative deprivation as other public services seek to increase their shares of national budgets. Within the educational sector there are increasing signs of more emphasis being put on primary and secondary education, whereas during the nineteen-sixties it was higher education that expanded most rapidly.

Forecasting and planning

The past decade has seen a phenomenal growth of educational planning activities, some of which are documented in this paper. Whereas in 1960 very few O.E.C.D. countries had an explicit planning group within the national education ministry, by 1970 it is possible to identify such a group in nearly all countries, even those which strictly speaking have

no national ministry of education. It is suggested that O.E.C.D. Mediterranean Regional Project (MRP) and Educational Investment and Planning (EIP) Programmes may have made a significant contribution to the creation of such groups.

It is also suggested, however, that, so far, the contribution of such planning groups to policy-making has for the most part been marginal. It is possible to identify two sets of reasons for this. The first is that the problem of integrating long-term planning with policy decisions which are necessarily taken in the short period has not yet been successfully overcome. The most hopeful approach seems to be the "rolling planning" within a multi-year budget that has been developed in some Scandinavian countries and is being experimented with in the United Kingdom and the United States. Educational plans must be much more flexible than they have been hitherto and they must comprise an analysis of the costs and benefits of following a number of different policies. The paper suggests that it is the job of the planner to show the costs and benefits of different possible policy decisions, it is the job of the policy-maker to choose between them having been shown a wide range of options.

The other general failure of planning groups is that they have devoted most of their attention to forecasting - forecasting the number of students in the different branches of education on various social demand criteria. It is possible to attack this preoccupation on a priori grounds and several academic educational planners have done so. (1) However, what has damaged their credibility much more is that the forecasts have usually proved wrong. In nearly all cases forecasts have underestimated the actual expansion in enrolments that has taken place. Governments have faced the problem, well known to urban traffic planners, that the more schools and universities they have built, the more people have been coming forward to fill them. There seems to have been an enormous potential demand for education which only became actual when it began to be realisable. In concrete terms, many children probably left school at the earliest opportunity because they thought their chances of continuing to university small. They thus did not appear in the measured demand for university places. When chances of university entry improved, these children began to stay on after compulsory education. The problem is exacerbated by the fact that public subsidy of higher education means that private "rates of return" on higher education are far higher than social "rates of return" (2). This process appears to be continuing unabated. How long it will continue can only be guessed, but it is suggested that the failure of

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- (1) See for example, Decision Models in Educational Planning, by Armitage, Smith and Alper (Allen Lane, London 1969).
 - (2) i.e. the relationship between extra earnings and costs associated with any particular educational process.

forecasting so far necessitates a radically new approach to the problem of relating forecasting, planning and policy-making.

Planning and policy problems of the nineteen-seventies

The paper concludes with some questions about policy objectives for the next decade and some suggestions for new directions of endeavour by educational planners.

The policy questions are:

- (i) Can educational expansion continue to be governed largely by social demand criteria?
- (ii) Should more emphasis than heretofore be put on increasing educational efficiency? If so, how is this to be achieved without falling foul of accusations of attacking educational standards?
- (iii) Is there any danger of unemployed graduates becoming a problem in O.E.C.D. countries, particularly with the very rapid expansion of general studies in secondary schools and social studies in higher education?
- (iv) How can equality of opportunity become real as opposed to merely a professed objective of educational policy in O.E.C.D. countries?
- (v) Is it desirable to take steps to bring social rates of return to education into line with private rates of return? If so, how?
- (vi) Should other steps be taken to increase the funds available for education from sources other than the central government budget? If so, what?

Four suggestions are made for the further technical development of educational planning activities:

- (i) Much more research into how educational systems work, in particular into the behaviour and motivations of students as they respond to policy decisions. More effort should be made to incorporate the results of research into planning and policy.
- (ii) The frequent revision of forecasts to take account of changes in policy objectives and actual events. Too many of the forecasts of the nineteen-sixties have been of the once-and-for-all type, or have been revised very infrequently.

- (iii) Attempts should be made to present ranges of alternative projections based on different policy objectives, with at least broad indications of the costs and benefits associated with each policy.
- (iv) Finally, efforts should be made to adjust the system so that there is a greater coincidence between private and social costs and benefits. This is a very complex task because of the multiple objectives of education. It will involve the use of much more complex planning models than have been developed so far.

It is recognised that all these will require much greater resources for educational research and planning than hitherto, but it is suggested that this will be more economic than cheaply produced forecasts that turn out to be wrong.

EDUCATIONAL POLICIES, PLANS AND FORECASTS DURING THE
NINETEEN-SIXTIES AND SEVENTIES

CONTENTS

I.	EDUCATIONAL OBJECTIVES IN THE 1960's	page 1
II.	THE ORGANISATION OF EDUCATIONAL PLANNING IN O.E.C.D. MEMBER COUNTRIES	page 7
	France	page 7
	Britain	page 9
	Scandinavia	page 11
	The Mediterranean Regional Project	page 13
	The United States	page 14
	Summary	page 15
	International Influences in Educational Planning	page 16
III.	RECENT EXPERIENCES IN EDUCATIONAL FORECASTING ..	page 17
	Social Demand Forecasts	page 18
	Some National Experiences in Forecasting Enrolments	page 19
	Social Demand Forecasts - General Considerations	page 31
	Manpower Forecasts	page 34
IV.	EDUCATIONAL PLANNING AND POLICY - SOME SUGGESTIONS FOR THE SEVENTIES	page 37
	(i) Better understanding of the system	page 38
	(ii) Continuous revision of forecasts	page 39
	(iii) Assessing the implications of possible policy decisions	page 40
	(iv) Establishing the system as a self- regulating, adaptive control mechanism	page 44
	Concluding Remarks on Objectives	page 45

EDUCATIONAL POLICIES, PLANS AND FORECASTS DURING THE NINETEEN-SIXTIES AND SEVENTIES

I. EDUCATIONAL OBJECTIVES IN THE 1960's

1. By far the most outstanding characteristic of the educational systems of all O.E.C.D. countries during the past decade was expansion.
2. As an objective of educational policy, expansion has, broadly, had two points of focus - the expansion of educational provision for all and the equalisation of educational opportunity. In order to meet these twin objectives, the period of compulsory education has been lengthened in most countries, provision of post-secondary and other higher education has increased in response to "social demand", there has been a large increase in the provision of scholarships and other forms of financial support for students and there has been a widespread movement towards the abolition of selective schools in secondary education.
3. Expansion as a policy objective has largely been achieved. The increase in numbers in most Member countries has been phenomenal. An indication of the increase in upper secondary and higher education between 1955 and 1965 is shown in Table 1. It will be seen that enrolment in higher education more than doubled in nearly all countries and so did the number of those obtaining upper secondary qualifications. The expansion has been due in part to the rise in numbers of children in the relevant age groups, but even more to the increasing proportion of each age group staying on longer and longer beyond the minimum school-leaving age. In countries for which figures were found, similar rates of increase have continued up to the present.
4. The objective of providing equal educational opportunity has in general proved more elusive. The standard international references on this subject are the:
 - (i) O.E.C.D. publication on Ability and Educational Opportunity (1961) - the report of the O.E.C.D. Conference on "Ability and Educational Opportunity" held in Kungälv, Sweden, 1961.
 - (ii) UNESCO Conference papers on Access to Higher Education (1967) - Conference of Ministers of Education of European Member States, held in Vienna, 1967.
 - (iii) O.E.C.D. report on the Development of Secondary Education - Trends and Implications (1969).
5. The interesting point about the first of these volumes was what in retrospect appears almost like nineteenth century optimism in believing that the expected educational expansion could bring social equality with it automatically. In

summarising the conference, A.H. Halsey remarked: "As we have repeatedly noted, economic development has profoundly modified the context of social forces in which the educational process goes on, and changing forms of social stratification are among the most obvious aspects of contemporary economic prosperity. One characteristic feature of these developments is that, as first primary and then secondary education has expanded, so social class wastage in the traditional form of lack of adequate educational opportunity has been, so to say, pushed further and further up into the higher stages of education."

Table 1

INDEX OF INCREASES 1955 - 1965 (1955 = 100)

- (a) Number of Secondary School-Leavers qualified to enter Higher Education.
- (b) Number of Qualified Leavers as percentage of relevant age group.
- (c) Number of Students in all forms of Higher Education.

	(a)	(b)	(c)
Austria	230	310	255
Belgium	247	216	219
Denmark	216	140	239
Finland	272	180	240
France	264	178	244
Germany	153	163	210
Greece	n.a.	n.a.	278
Italy	153	161	189
Ireland	208	184	198
Japan	153	114	178
Luxembourg	n.a.	n.a.	214
Netherlands	199	140	385
Norway	268	163	385
Portugal	n.a.	n.a.	197
Spain	196	167	215
Sweden	262	192	285
Switzerland	202	160	214
Turkey	313	253	267
United Kingdom	265	192	212
United States	191	123	208
Yugoslavia	183	168	266

Sources: (a) and (b) : Development of Secondary Education
op.cit.

(c) : Collected by O.E.C.D. Secretariat for Higher Education Study.

6. By the middle of the decade Henri Janne was concluding in his UNESCO report presented to the Conference of Ministers of Education of European Member States on Access to Higher Education "..... the democratization of higher education, although steadily progressing - however slowly - is far from full achievement in the countries of Western Europe.

"The influence of social conditions, including social stratification, is still very marked in regard to access to all levels of education, academic success, backwardness and drop-outs, and, finally, educational and occupational guidance. It is the latter which determines to a large extent the future social level of each individual and is in turn affected not only by social conditions but also by the very structures of the educational system and their relative ability or in ability to correct and offset those conditions.

"The effects of social conditions are cumulative: poor results at school make access to higher education more difficult while, for the poorer pupil, retardation cuts it off altogether, and, with such access cut off and/or mediocre results, the student finds himself channelled to lower-ranking studies leading to lower-ranking occupations."

7. By 1969 progress was still slow, according to Alan Little and Denis Kallen in the O.E.C.D. 1969 report (1), "Although progress has been made, the inequalities have persisted the best that most countries can claim is partial success in achieving such equalisation of participation [among different social groups]. Even in systems with high rates of participation in upper secondary and higher education, such as those of the United States and Japan, marked class disparities persist and, especially in the United States, regional and ethnic differences in participation rates have recently been given considerable publicity. Further, systems that have recently reported dramatic increases in enrolments (France, Netherlands, Sweden, United Kingdom), and explicit educational policies to reduce disparities, have found these disparities to be very tenacious."

8. There is in practice an inherent anti-egalitarian bias in the social demand approach to educational planning which has provided the main policy basis of the expansion. This is a paradox, because initially one of the attractions of this approach was its intuitive appeal to those who claim that educational opportunity should be as widespread and democratic as possible. The social demand approach claims broadly that places in any branch of education should be provided free of charge by the public authorities for all children who seek them

(1) Development of Secondary Education, op.cit.

and who have proved that they have the necessary ability to benefit from courses in the particular branch of education in which a place is sought. The weakness of the approach from the point of view of the democratisation of educational opportunity is only just coming to be realised. Numerous studies in many countries, of which the most well-known are probably the Coleman report in the United States, the Plowden report in the United Kingdom, the work of Husén in Sweden, and Sauvy and Girard in France, have shown that right from the start, in all school types, social class has a very strong effect on a child's performance at school. Essentially children from upper and middle class homes and from certain social, religious and ethnic groups start school with greater numerical and verbal ability than those of other groups in society. The nature of most school systems is such that these initial differences in ability are accentuated. This is particularly the case in systems such as that in France, where children who do well have the possibility right from the start of accelerated promotion. In the United Kingdom, where accelerated promotion in primary schools is exceptional, it has been shown that differences in measured intelligence at 8 years old are considerably magnified by 11 years (1).

9. Thus, those who start school with an initial advantage have this advantage increased as they proceed through the educational system, so that by the time of entry into higher education it is predominantly middle and upper class children who remain.

10. Three factors further increase their advantage. First, it has usually been accepted that the higher the level of education the more the resource input per student should be. Thus each extra year of education that a student undertakes results in a greater input of educational resources than the preceding year. Secondly, after the end of compulsory education, income foregone is a factor influencing decisions about whether to stay on in school or not. The poorer the family the less easy it is to forego these earnings. Many countries which do have extensive grants and scholarships in higher education do not have them in upper secondary schools. Finally, there is a large number of sociological and cultural factors which in essence amount to the fact that it is much easier for a child to stay on at school if his friends do, and if his parents have a positive attitude to education, which they acquire mainly from their own educational experiences. Since, in most urban areas at least, particular social groups are concentrated in particular areas, some schools develop a strong tradition of continued education and others a tradition of leaving at the earliest opportunity. It has been fairly conclusively shown that even the most enlightened teachers have little influence

(1) In "The Home and the School" by J.W.B. Douglas, MacGibbon and Kee (London 1964).

against these social forces unless strong positive measures are taken. It was only towards the end of the decade that the notion of providing more resources for the educationally backward than for the advantaged became something more than an outrageous theoretical idea.

11. Apart from expansion in response to social demand, the other two principal objectives of educational planning and policy during the past ten years have been to make educational systems relevant to the needs of economic growth and to make them economically and educationally efficient.

12. The manpower approach to educational planning has been the most widely discussed and perhaps the most widely criticised means of setting educational objectives. The rationale of the manpower approach was set out by Parnes in 1963 (1): "The rationale for according manpower forecasts a prominent role in assessing educational needs is perfectly straightforward. The creation of a new steel works, for example, is meaningless unless provision is also made for the scientists, engineers, managers, technicians, skilled workers, clerical staff, etc. necessary to operate it. Since one of the functions of the educational system in a society is to provide its work force with the abilities required for productive activity, it follows that that system must be reasonably well geared to the production requirement of the economy." Parnes and other manpower planners were attacked on three counts. In the first place it was claimed that the role of education is not to provide qualified manpower for the labour force; this is the function of specialised vocational training. The purpose of the educational system is to develop individuals to the full extent of their abilities and interests. The pragmatic answer to this criticism is that there is quite a strong correlation between people's educational qualifications and their occupations. This has been revealed in the O.E.C.D. statistical compilation of statistics on education and occupation in 53 countries (2). The correlation is by no means perfect and this point will be referred to later in the paper. However, the fact that there is a correlation is evidence that, rightly or wrongly, educational qualification is used as a criterion in selecting people for many occupations.

13. The second criticism of the manpower approach, as it has been developed so far, has come mainly from economists. This is that it is based on the notion of technically fixed relationships between output and input of various kinds of qualified manpower. Thus, if economic output is specified, it is possible to estimate the required number of people in the labour force with various educational qualifications. Many economists do not accept this view of the economy. They claim that within wide limits differently qualified manpower can be substituted for each other depending on relative prices. Instead of estimating how many members of the labour force should have each type of educational qualifications, it is claimed that efforts should be made to calculate the economic "rate of return"

(1) Planning Education for Economic and Social Development, O.E.C.D. 1963.

(2) Statistics of the Occupational and Educational Structure of the Labour Force in 53 Countries, O.E.C.D. 1969.

to different types of education in order to evaluate cost/benefit relationships. A high rate of return is a signal for more expenditure in that branch of education. This debate corresponds to the more general unresolved debate amongst economists of whether the economy is more correctly described as a set of fixed input/output relationships, or whether these input/output relationships are sensitive to the relative prices of different inputs and outputs. (1)

14. However, it is the third criticism that has in practice proved most serious for manpower planning. This is that, to be useful, forecasts need to be made for several years ahead and technological change make this impossible to do. A wide range of techniques has been developed to try to overcome this problem, without marked success.

15. Despite the popularity of manpower forecasting in the literature of educational planning, it appears not to have been nearly so important in actual educational decisions as social demand considerations. Certainly, particular cases can be found where manpower forecasts have led to decisions to expand or contract a particular branch of higher education, usually medical and engineering faculties, but in general the effect of the numerous manpower forecasts of the decade has been to publicise shortages of scientists and technologists, particularly below the top educational levels. Despite these findings, students have insisted on obtaining more and more education up to the highest levels, and in many countries there has been a marked trend away from science in upper secondary education. Parallel systems of vocational and technical secondary education have in general been failures in that they have been considered very much second best by students.

16. The other objective, that of efficiency, has not been achieved. It is in fact doubtful whether in most countries it became a serious objective until the last year or two. There has probably never been a decade in which resources for education, particularly higher education, have been so readily forthcoming in so many countries. It may be that this was the real triumph of the economists and manpower forecasters. Policy-makers were persuaded not only that educational expenditures could be considered as investments, but that they were investments with almost unlimited returns. Whatever the reasons, while the output of educational systems whether measured in student numbers or graduates has increased enormously, the main inputs

(1) For an exposition of the parallels between the manpower planning versus rate of return approach to educational planning, and the input/output versus production function approach in economics, see "Different Approaches to Educational Planning" by Mark Blaug in Economic Journal (London), June 1967.

and the money expenditures which measure them have in most countries increased equally rapidly. It is widely believed that this situation cannot continue: that education's share of public budgets is now too high for it to continue to grow at the same rate. Since the social pressure of student numbers is unlikely to diminish, the emphasis must be more and more on efficiency. This is becoming increasingly recognised, but its practical implications are far from generally accepted. Increased efficiency means reducing the amount of input per unit of output. Since the main inputs are students, teachers, buildings and equipment, the aim must be to increase the number of students per teacher, to use buildings and equipment more intensively, and to reduce student wastage rates without lowering the quality of graduates from each branch of education. At present there is very little knowledge of the extent of resource savings that could be achieved from any of these measures.

II. THE ORGANISATION OF EDUCATIONAL PLANNING IN O.E.C.D. MEMBER COUNTRIES

17. If there is one activity which has expanded more rapidly since 1960 than education it is educational planning. In terms of any reasonable indicators - number of words or papers devoted to the subject, number of specialised journals; number of students, research workers, research units or Ph.D theses in the field; number of civil servants engaged in the activity or number of public authority planning groups in existence - the expansion of educational planning activities has not been just two- or threefold but has been of the order of several hundred per cent. If 1950 rather than 1960 is taken as the base year, the increase has been virtually infinite since educational planning as a systematic, regularly organised activity hardly existed at the former date. The role of the national ministry of education was to administer the system and to ensure that it ran smoothly on a day-to-day basis. This explains why many of the countries with decentralised educational administration felt little need for any national authority dealing with educational matters, and why, for example, the U.S. Office of Education was little more than a data-gathering agency (1).

France

18. In 1960 Svennilson, Edding and Elvin (2) cited France as the outstanding example of advanced educational planning. This was mainly on the basis of the work of the Commission de l'Equipe-ment Scolaire, Universitaire et Sportif within the

- (1) One of the striking features of the early O.E.C.D. reports on the subject, as compared with those of the end of the decade, is the crude and scanty nature of much of the statistical information presented.
- (2) See "Targets for Education in Europe in 1970" in Policy Conference on Economic Growth and Investment in Education (O.E.C.D. 1962)

framework of overall French economic planning. The work of this Commission was described in some detail for O.E.C.D. by its rapporteur, M. Raymond Poignant, at a meeting of the Educational Investment and Planning (E.I.P.) group in 1963. He describes the work then in progress on preparing the IVth Plan. (1)

" In France we have the good fortune (as we think) of working within a general plan. The forecasts form part of a whole, and are published by the 'Commissariat General du Plan' The work fits into a larger whole which naturally simplifies conclusions. As an example, the Government waits for the educational study in order to take decisions with regard to the allocation for school equipment during the next four years The preparation of the Plan, the drafting of the report and its execution are done on a national scale by the civil service as a whole. The report is based on enquiries carried out among all local authorities, so that the educational authorities in the various provinces, departments and separate establishments are associated with the preparation of the Plan from the outset.

" The Report is then summarised in a document put before Parliament; this is the General Plan for Economic and Social Development, containing a chapter on education, accompanied by applications for funds for school buildings, primary schools, secondary schools, vocational schools and universities. Parliament studies the Report, discusses it and after lengthy discussion generally adopts the Plan.

" Of course there is always a gap between what the 'Commission du Plan' asks and what the Government decides, but the gap is steadily narrowing. Drawing up a Plan is not a matter of defining an ideal, but of adjusting limited possibilities to limitless requirements, and there is clearly a difference between making forecasts, determining requirements and financing them. And unfortunately only 85 or 90 per cent of the funds requested are normally granted." Mr. Poignant went on to describe the related work of the Manpower Commission but admitted that "even in France there is still no very close link between the plans for educational development and the projections of active population". There is evidence that the Manpower Commission has since 1963 attempted to remedy this weakness by making substantial efforts to provide information on qualified manpower needs that are relevant to educational planning. (2) However, it also appears to have been the case that there has been in France during the 1960's a substantial gap between the educational planning procedures

(1) DAS/EID/63.1 (add).

(2) For a useful account of French manpower planning experience during the 1960's see "Comparaison des Prévisions d'emploi par Profession du Ve Plan et de l'évolution réelle de l'emploi de 1962 à 1968", in Population (Paris, February 1970)

described above, and the policy decisions actually taken. This showed itself partly in the wide divergence between forecast enrolments in the various plans and actual outcomes, but also in the many reforms, major and minor, throughout the 1960's whose relationship with the Plan is remote, but which undoubtedly affected the educational environment within which planning should have taken place. The most conspicuous of these divergences was, of course, in the months following the "events" of May 1968 when, for a time, education was in the forefront of national policy and, therefore, perhaps too important to be left to the planners. In the months following May 1968 major reforms of higher education were set in motion, including substantial changes in university administration to encourage "participation", and the establishment of new university institutions in the Paris area to relieve overcrowding in the University of Paris. There were, however, less striking examples earlier, of which perhaps the most notable were the "Fouchet" reforms of secondary education in 1962. These reforms undoubtedly were partly responsible for the under-estimation of the secondary education enrolment projections in the IVth Plan. Similarly the reform of the university structure and baccalauréat were not taken into account by the Planning Commission, although changes of this nature clearly affect the extent of "social demand" for higher education.

One step taken at the end of 1965 to remedy this growing divergence between the Plan and real decision-taking in French education was the extension of the role of the "Service Central des Statistiques et de la Conjoncture" of the Ministry of National Education. Its structure was defined thus: "In addition to general administrative agencies a division for compiling teaching and educational statistics, a studies and analysis division (statistical studies and forecasts, analyses of the educational system, demographic and economic reporting, preparation and control of data processing) a documentation and statistical information bureau and a bureau for research on programmes of research on educational requirements responsibility for centralising and exploiting information about research in educational development and also for studying and promoting research programmes on educational development with special reference to the technological and socio-occupational analysis of educational requirements".

Britain

19. Svernilson and his colleagues found the British situation with regard to educational planning very different ... "the tradition in Great Britain is one of devolution to local educational authorities and indeed to the schools themselves". Educational planning at that time, and to a large extent since, was the preparation of reports by ad hoc advisory committees. The most important in recent years have been the Crowther Report (1959) on the Education of Children between the Ages of 15 and 18, the Alhermarle Report (1960) on the Youth Service,

the Newsom Report (1963) on Secondary Education of Average and less than Average Ability, the Robbins Report (1963) on Higher Education, and the Plowden Report (1967) on Primary Schools.

20. However, despite the devolution of responsibility to local authorities and individual schools and universities, and despite the work of the ad hoc advisory committees, the Department of Education and Science has a clear responsibility for general direction and it is increasing its role as a forecasting, planning and policy-making body. (1) In particular, it normally provides secretariat and research facilities to the ad hoc committees. Indeed it can be claimed that one function of these committees is to put across to the public, in the guise of informed opinion, policies which might be less acceptable if they emanated directly from a government department.

21. Some of the forecasting and planning functions were formalised in 1966 with the creation of the Planning Branch, whose responsibilities were defined by the U.K. representative to the EIP as: (2)

- (a) the control of planning services;
- (b) the co-ordination of various elements of policy;
- (c) special studies on long-term planning.

22. The Branch has responsibility also for the Department's educational research programme and its aim is "to use the available funds specifically as an instrument of policy and to coordinate research proposals so as to make the maximum contribution to policy formation".

23. The most important of the special studies on long-term planning to date has been that on the "Rationale of Student Numbers in Higher Education". This project, of which the first main report is near completion, aims to bring up to date, extend, and subject to continuous revision the quantitative work of the Robbins Committee in line with changing policy needs.

24. Apart from this, most of the work of the Planning Branch has been concerned with improving the information base for policy-making, mainly by improving statistics. The

(1) These notes refer to the situation in England and Wales. Scotland and Northern Ireland are completely independent in educational matters. However some of the advisory committees have also dealt with these two countries, and development in the organisation of educational planning has been, in general, along similar lines.

(2) DAS/EID/67.31

available "stock" statistics of pupil numbers have improved beyond recognition since 1960 and gradually "flow" statistics are being collected which enable movements of pupils between educational activities to be traced and analysed. There have been similar developments in many O.E.C.D. countries.

25. The Planning Branch also publishes annually a 25-year forecast of the number of children of each age between 1 and 19 in school and the number of school-leavers with various qualifications. These forecasts are all based on trend projections and are revised each year. This annual revision is vital since, although trend projections of enrolment rates are notoriously inaccurate for long periods, decisions made on this basis can, in principle at least, be adjusted annually as revised forecasts become available. This is discussed in the final section.

26. It remains true, however, that during the nineteen-sixties educational decisions in the U.K. were the resultant of many forces among which the various planning bodies described do not appear to have been outstandingly influential. Britain may be cited as an example of a country which has tried to plan largely by making the right information available to the right people at the right time. In any case the freedom of action of the central authorities is severely circumscribed by the power of the local authorities in primary and secondary education, and the universities in higher education. It is, however, the case that the various reports have played an important role in moulding informed public opinion by bringing the latest available research to bear on major policy issues - the Robbins Report changed the whole climate of opinion about higher education and the Plowden Report seems to be doing the same for nursery and primary education. Since it is public opinion which is ultimately responsible for formulating objectives and implementing policy, it may be claimed that the reports have served a useful purpose.

Scandinavia

27. Another country which has made extensive use of ad hoc advisory committees is Norway. As the Norwegian EIP representative reported in 1963 "... In the widest sense of the word there has been no lack of educational planning in Norway Nearly all our schools technical education, vocational education, ... higher education have been under review mostly by ad hoc commissions." A committee on higher education, making plans for the period to 1970, reported at about the same time as the Robbins Committee in Britain. Other bodies which have been important in Norway, as in some other countries, are the Research Councils. At the beginning of the decade they were responsible for most educational forecasts. However, as in many other countries, such ad hoc planning and forecasting activities proved to be inadequate

in a period of rapid educational expansion, and a Planning Department was established within the Ministry of Education in 1964. The immediate task of this group was the "preparation of a programme for the period 1966-1969 of activities in fields covered by the Ministry of Education, as part of the general four years' programme of the Norwegian Government".

28. An important development in Norway (as in other Scandinavian countries) is "rolling planning". This is a device by which a new four-year plan of public expenditure is made every year and revised in the light of policy decisions taken and exogenous circumstances in the previous year. The expenditure estimates for the first year of the four are worked out in much more detail and represent actual budgetary commitments for that year; for the following 3 years they are indications of what the public authorities are likely to do rather than definite legal commitments. All this takes place within longer-term perspectives set by the Royal Commissions and the Research Councils. Little evidence was available at the time this paper was written of whether this procedure had succeeded in integrating educational planning, policy formation and executive action.

29. Another Scandinavian country to undertake "rolling planning" is Sweden, which was considered by Svennilson and his colleagues in 1960 to be "another country with advanced educational planning machinery". A number of major educational reforms were instituted in the early 1960's of which the most important was that of becoming the first country in Europe with a fully comprehensive system of secondary education. This reform was fully implemented by 1968. However, from the viewpoint of this paper the most interesting development in Swedish educational planning during the decade is the attempt to introduce "rolling-reform", a concept even more ambitious than that of "rolling planning". The machinery by which it is hoped to bring this about is described in an article in the O.E.C.D. Observer of August 1967. The need for rolling-reform derives from the fact that "to produce their full effect educational reforms take a very long time, which may run into decades, and no sooner has one reform been carried through than others must be introduced The official Swedish view is that in the present-day world delays can no longer be tolerated, and that adjustments of the educational system to changing requirements must be continuous." The machinery for rolling-reform consists essentially of integrated programmes of research and planning from the Council of Educational Planning down to the individual educational institution. Flows of information between the various decision-making levels and the public at large are left as open as possible. The attempt is thus being made by means of information theory to convert the entire educational system into an adaptive control mechanism which learns immediately from its own experiences and the direction of whose progress can be altered by explicit policy decisions.

This extremely ambitious experiment is certainly a move in the right direction. Is it to be hoped that studies will be undertaken to evaluate its success.

The Mediterranean Regional Project

30. One group of countries, which started the decade with virtually no educational planning machinery but which for a short period at least received a lot of attention as they grappled with the problem of planning education for economic and social development, were those that took part in the Mediterranean Regional Project. This experience has been extensively written up elsewhere (1) and is not described here. It must be admitted, however, that in none of the six countries that took part in this enterprise have the plans been at all fully implemented. A prophet is indeed without honour in his own country. The MRP methodology has been exported to all parts of the world. The six countries themselves have for one reason or another, and with the possible exception of Yugoslavia, continued to take their educational policy decisions largely ignoring the work of the planners. Even in Yugoslavia, the most important development - the decentralisation of administrative control - proceeded quite separately from the MRP recommendations. However, in that country, even though control has been highly decentralised, policies are coordinated by a process of structured consultation. The research group which produced the MRP report has evolved into a unit undertaking educational planning research in areas of common interest. Planning is coordinated by the Federal Institute for Economic Planning which is mainly a research and advisory body and is responsible to the Federal Assembly. In Yugoslavia one weakness of these attempts at what might be called "participatory planning" are that too many of the initiatives still come from the centre. In the words of Professor Sefer, who prepared a background paper for the O.E.C.D. Secretariat on Educational Planning in Yugoslavia: "The greatest weakness of planning organs in the present phase resides in the fact that they still rely mostly on state organs and very little, and to an insufficient extent, on self-managing organisations and structures. Therefore, in the conditions of full decentralisation, all the measures taken on the basis of the plan have, more or less, the character of instruments exercising an indirect impact on the behaviour of a self-managing vehicle of decision-taking. Obviously this is not sufficient. It is foreseen that during the further development of the system, bodies of planning should become the joint organs of the state and of the economy, and other activities should be organised

(1) Especially in A Technical Evaluation of the First Stage of the Mediterranean Regional Project, by R.G. Hollister (O.E.C.D. 1967), and in An Experiment in Planning by Six Countries (O.E.C.D. 1965).

on a self-management basis, and that the plan should be elaborated jointly by self-management and state bodies." It is to be hoped that these aspirations succeed.

31. Among the other MRP countries, Portugal established a very strong technical planning group in the Ministry of Education in 1966. This group undertakes various studies of educational policy problems, including an ambitious attempt to construct a computable model of the Portuguese educational system. In Spain also a similar group works in the Ministry of Education, whereas in Greece and Turkey educational planning is in theory more closely linked to economic development planning, in the former case by being located in the Ministry of Coordination and in the latter by being situated within the framework of the five-year development plans. An interesting aspect of recent Turkish educational planning is the stress put on qualitative aspects of education. This has been relatively neglected in much of the educational planning of the past decade. As was bluntly admitted in the O.E.C.D. Handbook of Methods and Statistical Needs for Educational Planning "nothing has been said about estimating the extent to which courses leading to different educational qualifications actually do qualify people to perform the functions that they purport to. Is a man with a university degree in civil engineering actually competent to build bridges?" Such vitally important problems have hardly been considered in quantitative educational planning.

The United States

32. The United States is a very special case, partly on account of its vast size - in terms of population it is almost as large as all the European Member countries of O.E.C.D. combined. In addition, the Federal Government has constitutionally no powers in the field of education. Thus the picture in the U.S.A. is very diversified; states such as California and New York have educational planning machinery as advanced as any in the world, in some other states it is virtually non-existent. At the same time, educational planning and economics of education, as academic subjects, are undoubtedly more developed in U.S. universities than anywhere else. Educational forecasts are made and models are built by hundreds of institutions and individuals.

33. At the Federal level three developments may be noted. First has been the increasing expenditure by the Federal Government on education. This rose from about 7 per cent of total educational expenditure in 1960 to 12.5 per cent in 1967. When this is considered in conjunction with the 10 per cent per annum increase in overall educational expenditure throughout the period, it gives the idea of the increase in the amount of Federal expenditure - it doubled between 1963 and 1968.

34. The second interesting development was the Presidential directive in 1965 instructing all government agencies to make use of the programme budgeting techniques developed in the early 1960's, in the Department of Defense. This in effect meant that a planning machinery had to be established in the Office of Education - not directly to plan the development of U.S. education, but in order to be able to develop criteria for the allocation of Federal expenditures.

35. The third development of interest, though not directly governmental, is the establishment of the Carnegie Commission on Higher Education. This Commission will for the first time study the whole of the higher education system of the United States and make recommendations about future developments.

36. A similar movement towards some form of national planning in a decentralised system has occurred in Germany, and there are indications of similar developments in the two countries which started the decade with absolutely no formal national or federal interest in education - Switzerland and Canada.

Summary

37. In summary it may be claimed that while educational policy is a highly complex process involving the participation of many decision-makers from the individual citizen to the Minister of Education, there has been a marked tendency in most O.E.C.D. countries, during the past decade, for official groups to be established with responsibility for national educational planning. The precise function of these groups varies according to the degrees of responsibility for education of the national authorities and the extent to which the country is embarking on an active policy of educational development. However, in no case have such educational planning groups so far been at the centre of the national educational stage; in Britain and Norway, for example, they have supplied the research and other facilities for Royal Commissions rather than the substance; in general they provide the information on which decisions may be taken rather than advice on the decisions that should be taken. This is perhaps desirable; it permits the planners to work relatively unhampered by the vagaries of public and political opinion and permits them to devote their attention to the complex technical issues rather than endlessly debating questions of value judgement. However it also has its dangers. Of these the most serious is that just when they are needed most, as in the present world crisis in higher education, the planners often have little to say. For a decade they have demonstrated that expansion of higher education is desirable from social and economic viewpoints and they have not given sufficient thought to the content of higher education, the structure of higher education or the cost of higher education. The result is that in many countries important decisions are currently being made with very little advice from the groups

that ought to be most qualified to give it. There are similar examples in the reforms of secondary education undertaken in many O.E.C.D. countries during the decade.

38. The major part of their technical work has been forecasting: forecasting of social demand, forecasting of manpower needs, forecasting teacher demand and supply, and forecasting of expenditure. How they have fared in some of these attempts is the subject of a later section. In anticipation it may be claimed that, while maintaining an interest in the improvement of forecasting techniques, the educational planner of the 1970's will be far more concerned with questions of content, structure and efficiency. He will no longer simply convince himself that he is preparing the plan, rather he will be concerned with a continuous planning activity in which all educational discussion are subjected to cost-effectiveness analyses and of which the current Scandinavian attempts at rolling-reform may be a forerunner. The educational planner of the next decade must convince policy-makers of the need for rational analysis as a basis for decision-taking. But to do this convincingly, planning techniques must become more refined, realistic and subtle.

International Influences in Educational Planning

39. Parallel and perhaps in some cases antecedent to the growth of national educational planning groups has been the development of an international network of conferences, seminars, courses, exchange visits and studies. The O.E.C.D. itself has been a prime mover in this, and the regular EIP meetings and experts group meetings have become one of the most important international forums of discussion of the technical problems of educational planning.

40. Other international bodies active in the field have been the Council of Europe, UNESCO and the European Economic Community. The Council of Europe organises meetings of European Ministers of Education every 18 months and produces many publications on all aspects of education. UNESCO has of course world-wide interests, directed mainly towards developing countries, but it has undertaken a number of activities specifically in Europe where it has the advantage of East as well as West European membership. The educational work of the EEC appears so far to have been confined to statistical comparisons between the six Member countries.

41. It is extremely difficult to assess the effects of this international activity. Despite all the joint discussion of common problems, most countries have jealously guarded their own educational and cultural traditions. Conversely, the development of different national educational systems during the period has been too similar to be simply the result of coincidence, or some iron law of the development of education.

42. The role of international collaboration is an example of the extent to which educational decisions result from the gradual accretion of numerous diverse influences rather than being in some way the result of control-panel decisions like a piece of engineering equipment. In the research undertaken for the present paper virtually no example could be found of any educational decision which could be unequivocally attributed to an attempt to benefit from the experience of another country or to the result of advice from an international organisation.

43. However, decisions which were clearly influenced by international experience were numerous. The creation of planning groups themselves was strongly influenced by the international demonstration effect - directly in such countries as Portugal, Spain, Greece, Yugoslavia, Austria, Ireland, Belgium and Iceland, where the groups were originally established to prepare a planning report for O.E.C.D.; and indirectly in the case of Germany, Britain, Norway and Denmark, where there can be little doubt that international experience played an important role in the establishment of planning or research groups. In other countries, such as France and the Netherlands and Sweden, the orientation of the research work of the planning groups has been strongly influenced by experiences communicated through O.E.C.D. and other international organisations. Methodologically the development of manpower forecasting and individualised data on students owes much to international cooperation.

44. It would perhaps not be unduly cynical to suggest that international organisations and international experience may have been used by national educational planners and policy-makers rather in the way they may have used ad hoc advisory committees on occasions - as a device to lend support to policies which national administrators have already formulated.

III. RECENT EXPERIENCES IN EDUCATIONAL FORECASTING

45. Two main types of forecasting have been undertaken by educational planners during the past decade, corresponding to what have come to be called the social demand approach and the manpower approach to educational planning. Social demand forecasting is broadly the attempt to predict the future inputs of students who will be "demanding" to enter any particular branch of education, whereas the manpower approach attempts to estimate the required "output" of graduates from each branch of education. Both imply the existence of some more or less sophisticated educational model to convert estimates of input or output into the number of students in the various educational activities.

SOCIAL DEMAND FORECASTS

46. This term has come to be used to describe the attempts to forecast the number of students who will be seeking or "demanding" entry into one or a number of branches of education. They usually rely on the more or less sophisticated statistical projection of trends, the implication being that such trends reflect the gradual growth of "social demand" for education. The projections of numbers of pupils seeking entry to one educational activity are usually based on the projections of enrolment "ratios" in the preceding activity, implying that a known (and probably changing) proportion of each cohort (usually defined in terms of an age group) has the "propensity" to enter the various branches of education. Such projections are by far the most common basis for planning decisions. An indication of how widespread such forecasts have been is given by Tables 2, 3 and 4 which summarise a variety of forecasts that were made in the late nineteen-fifties and early nineteen-sixties. The tables also show that experience with these forecasts has not been altogether happy. There has been a general tendency to underestimate, often very considerably, the growth in enrolments in upper secondary and higher education.

47. Table 2 shows projections of enrolments made for the paper on "Targets for Education in Europe in 1970", by Svernilson, Edding and Elvin, which was presented to the C.E.C.D. 1961 Washington Conference on Economic Growth and Investment in Education. (1) These projections were made in terms of broad age groups (5-14 years, 15-19 years and 20-24 years). The methodology behind the projections is nowhere clearly explained, but essentially it consisted of linear projections of trends in the enrolment rates that had been experienced during the late nineteen-fifties multiplied by the official demographic forecasts of the number of persons in each age group. The table compares actual enrolments in 1965 with a projected figure for 1965 given by a linear interpolation of the 1960 enrolment ratio and the forecast ratio for 1970 multiplied by the population in the relevant age group in 1965.

48. In Table 3 a similar comparison is made between the projections published by the O.E.C.D. in Resources of Scientific and Technical Personnel in the O.E.C.D. Area (2). The projections were derived from a questionnaire completed by national authorities and therefore may be taken to have had a slightly more authoritative status nationally than the Washington Conference figures. In both parts of the table only those countries have been included where ready comparisons could be made between the projections and the actual outcome. Thus, Germany and the U.K. are omitted because there were clearly considerable anomalies in the way the different branches of education were treated in the two O.E.C.D. documents.

(1) This comparison relies heavily on an internal O.E.C.D. Secretariat paper prepared by J.P. Pellegrin in 1967.

(2) Paris, 1963.

49. In general it can readily be seen that in 1960 all the forecasts underestimated the growth in enrolments in higher education; in upper secondary education experience has been more varied but none of the projections has proved very accurate. One fact which emerges clearly from Table 2 is that there has been a much greater tendency for secondary school graduates to stay on to higher education than the forecasters expected. This can be seen by calculating for each country the coefficient

$$\frac{20 - 24 \text{ Actual Enrolments}}{15 - 19 \text{ Actual Enrolments}} \times \frac{15 - 19 \text{ Forecast Enrolments}}{20 - 24 \text{ Forecast Enrolments}}$$

In all cases except Ireland this coefficient is larger than 1, implying a greater than anticipated tendency to go on to higher education.

50. It can also be inferred from Table 2 that the errors in the enrolment forecasts have been due in the main to miscalculation of the trend in enrolment ratios. The demographic forecasts of persons in the age group have proved very accurate, as might be expected, since in the five-year projection period considered all the children who were in school at the end of the period were already born when the projections were made.

51. In Table 4, and in the remainder of this section, attention is devoted to a number of the earlier national experiences in forecasting educational enrolments. It is necessary to concentrate on forecasts that were made some years ago in order to make comparisons with actual enrolments over as long as possible a forecast period. Once again, attention is directed mainly at enrolments in higher education. This is for two reasons: first a high proportion of the forecasts have been concerned with higher education; second, as the culmination of the educational pyramid projection, errors are likely to be maximised in this part of the system thus dramatising the divergence between forecasts and actual outcome. In this sense only the present paper possibly exaggerates the weaknesses of forecasting methods used in the past decade.

Some National Experiences in Forecasting Enrolments

52. France has one of the longest experiences of enrolment forecasting. Forecasts have been made within the framework of overall indicative economic planning. The technique of educational planning within the total framework has been to estimate the future number of students in each branch of education, as a basis for decisions by the public authorities on necessary capital and current expenditures during the period of the Plan and, much more loosely so far, to try to reconcile the likely output of graduates from each branch of education with the estimates of economic need for persons with such qualifications.

53. Results from two planning periods are considered here, those corresponding to the fourth and fifth economic Plans. The method of forecasting used has been broadly similar for each Plan and consists of a straightforward form of flow analysis. The number of students in any grade is estimated as a proportion of the number in that grade in the previous year (repeaters), plus a proportion of the number in the preceding grade in the preceding year (pupils progressing normally through the system). The analysis is based on the assumption that during his compulsory education the pupil has two "choices" open to him, to repeat a grade or to advance a grade; and in post-compulsory education he has three options: to repeat, advance, or leave the school system. If coefficients representing these three possibilities are known, and if initial entrants (corresponding to births six years previously) are known, it is possible to predict the number of pupils in each grade of the educational system. The key factor is, of course, the prediction of progression, repeater, and drop-out rates. The application of such methods has been made easier in France than in some other countries by the rather rigid structure of the French educational system from the bottom grade of primary schools to the top grade of secondary, and the similar division of higher education into distinct years of study.

54. The result of applying these techniques has been to underestimate the number of pupils in most of the main branches of education. In elementary schools the number of pupils between 1960 and 1968 has remained almost constant at just over 4 million - whereas both the fourth and fifth Plans projected a substantial decline; the 1Vth Plan projections made in 1960 were some 250,000 below the actual enrolments by 1967/68 and even the Vth Plan projections made in 1965 were some 100,000 below actual enrolments by 1967/68. One reason was that the provision of special schools for invalid and mentally backward children proceeded much more slowly than foreseen; but, much more important in the earlier period, the forecasters overestimated the speed with which the reform of the structure of secondary education would be implemented. According to the Fouchet reforms of 1962, a new college of general education replaced the last years of elementary education with an "observation cycle" that is considered a part of secondary education. Part of the reason for the slow implementation of these reforms was the unforeseen expansion of traditional secondary education. In this branch there has been a general tendency to underestimate the growth in enrolments, particularly in terms of the proportion of people staying on at school after compulsory education. This conceals, however, an interesting discrepancy: in general secondary education actual enrolments have exceeded plan forecasts quite considerably, whereas in technical education the forecasts were higher than the actual outcome. The main reason for this discrepancy appears to be that insufficient resources were devoted to secondary technical education: only 80 per cent of the resources required by the Plan were actually authorised. It is not clear whether the underlying cause was

a lack of desire by pupils to attend this type of school. This has been the case in other countries.

55. Table 4 shows that the French IVth Plan underestimated total enrolments in higher education at the end of the Plan period by 16 per cent. However, this reveals an interesting discrepancy. The actual enrolments in science faculties in 1964/65 fell short of the forecast figure by 9 per cent. However, there is no evidence that science faculties were starved of resources (rather the reverse), and the explanation of this discrepancy must lie in a failure of social demand for science places in universities to come up to the planners' expectations, or hopes.

56. The evidence so far available from the Vth Plan, shown in Table 4, suggests that in an attempt to avoid their previous mistakes, the planners overestimated the growth in total enrolments. Figures for the full four-year period were not available but the evidence suggests that in the third year of the Plan actual enrolments were 5 per cent below the forecast figure. This highlights one of the dangers of too much reliance on forecasting as a major planning tool. Forecasting of trends is essentially an arbitrary procedure. There is no objective scientific way of selecting the best shaped curve that fits a small number of observations in time. If planners find that their past forecasts have consistently underestimated enrolment growth, there may be a tendency to select trend extrapolations in the future that overestimate later enrolments (1).

57. It should be recalled that in France enrolments in higher education are almost entirely determined by "social demand" in that admission to university is granted to all who pass the baccalauréat. If, therefore, provision of places in higher education (teachers, equipment, etc.) is made on the basis of plan projections, and if the plan projections underestimate the growth in numbers, this leads to an inevitable overcrowding of universities.

58. Another country with considerable experience of enrolment forecasting is Yugoslavia. Two sets of forecasts for 1970 were made early in the decade, one in connection with the Mediterranean Regional Project and one in 1965 for the official five-year plan. With few exceptions they are based on demographic trends of generations of school age and trends in

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- (1) The effect can readily be seen by fitting a simple linear trend and a log-linear trend to the same set of observations. With the available evidence there is often no way of selecting which of these provides a "better" fit to past data. Yet if they are projected forward for ten years they give vastly different results. A general rule may be that in the long run all demographic series follow an "S" shaped or logistic curve. However, it appears that in the present stage of history most countries are on the rapidly rising part of the "S" for enrolments in upper secondary and higher education. There is no reliable way of predicting whether the slowing of the rate of growth will occur in the next 5, 10 or even 50 years.

TABLE 2

Washington Conference forecasts and enrolments in 1965

		Forecast enrolments (1965)	Forecast enrolment ratios (1965)	Actual enrolments (1965)	Actual enrolment ratio (1963)
<u>Sweden</u>	5 - 14	873	82%	898	85%
	15 - 19	246	40%	244	40%
	20 - 24	68	11.5%	80.5	13.3%
<u>Belgium</u>	5 - 14	1,370,000	96%	1,449,000	99%
	15 - 19	277,000	39%	309,000	44%
	20 - 24	39,000	6.9%	48,000	8.7%
<u>France</u>	5 - 14	7,266,000	91%	7,979,000	97%
	15 - 19	1,659,000	40%	1,575,000	39%
	20 - 24	162,000	5.6%	214,000	7.4%
<u>Netherlands</u>	5 - 14	1,896,000	87%	2,220,000	99%
	15 - 19	467,000	40%	438,000	38%
	20 - 24	55,000	6.1%	66,000	7.3%
<u>Ireland</u>	5 - 14	519,000	93%	537,000	94%
	15 - 19	51,000	23%	75,000	28%
	20 - 24	9,000	4.5%	12,000	6.6%
<u>Austria</u>	5 - 14	880,000	86%	862,000	82%
	15 - 19	100,000	20%	83,000	17%
	20 - 24	23,000	4.5%	29,000	5.4%

TABLE 3

Projections in OECD 3rd International Survey of
Scientific and Technical Personnel compared with actual outcome
1959 - 1963

		Forecast enrolments (1963)	Actual enrolments (1963)
<u>Italy</u>	Enrolments in universities	235,000	251,000
<u>Netherlands</u>	Enrolments in universities	49,000*	70,000*
<u>U.S.A.</u>	Enrolments in all post-secondary education	4.2 mn	4.5 mn
<u>Belgium</u>	" "	31,000	38,000
<u>France</u>	" "	264,000	338,000

Note: * Projected and actual enrolments 1965.

TABLE 4

Comparison of enrolment and graduates, forecasts and actual outcome: OECD countries

Country	Sources of Forecast	Year forecast made	What forecast	Projection year	No. of years after forecast	Projected figure	Actual figures	% over-estimate or under-estimate
Belgium	"Prévision des populations scolaires, Nouvelles projections jusqu'en 1970-71"	1959	Enrolments in general secondary schools (lower level)	1965/66	6	175,238	197,270	- 1%
		1959	" (upper level)	1965/66	6	75,000	85,349	- 14%
		1960	Enrolments in technical and vocational secondary schools (lower level)	1965/66	5	205,393	244,488	- 19%
		1960	" (upper level)	1965/66	5	49,459	71,279	- 44%
		1960	Grads. of general secondary (upper level)	1963/64	3	16,053	20,834	- 30%
		1960	Grads. of technical and vocational schools (upper level)	1962/63	2	13,181	11,890	+ 10%
Britain	Robbins Report	1962	Enrolments in H.E.	1967	5	328,000	376,000	- 15%
		1962	Enrolments in universities	1967	5	197,000	200,000	- 2%
		1961	Qualified school-leavers (2 or more 'A' levels)	1967	5	63,000	79,000	- 25%
France	IV Plan	1960/61	Enrolments, university faculties	1964/65	4	291,000	341,000	- 16%
		1960/61	Science faculties, enrolments	1964/65	4	117,000	106,000	+ 9%
	V Plan	1964/65	Enrolments, university faculties	1967/68	3	525,000	499,000	+ 5%
Germany	Academic Council	1959	Recommended enrolments in technical universities	1966	7	51,200	54,300	- 6%
		1959	Recommended enrolments in science and technology	1966	7	103,000	139,000	- 35%
		1959	Recommended enrolments in economics and social science	1966	7	22,000	44,000	-100%
	Standing Conference of Ministers of Education of Länder	1961	Enrolments in non-academic secondary education (excludes secondary level classes in Volkshule)	1967	6	744,000	830,000	- 12%
		1961	Enrolments in Gymnasien	1967	6	911,000	1,124,000	- 23%
	Academic Council	1962	Enrolments in Realschule	1967	6	557,000	640,000	- 12%
		1959	German students in universities	1966	7	225,000	241,000	- 7%
	Academic Council	1959	Recommended enrolments in existing universities	1966	7	193,000	265,000	- 34%
Italy	Relazione della Commissione di Indagine sull' Stato e sull' Sviluppo della Pubblica Istruzione	1961	Graduates of higher schools	1965/66	4	43,015	42,310	+ 2%
		1961	Graduates of technical institutes	1965/66	4	70,975	73,004	- 3%
		1961	Graduates of teacher training institutes	1965/66	4	29,600	31,358	- 6%
Japan	"Educational Planning in relation to Economic Planning in Japan"	1960	Enrolments in lower secondary schools	1964/65	4	6,489,000	6,475,693	+0.2%
		1960	Enrolments in upper secondary schools	1965/66	5	4,580,000	5,073,882	- 11%
		1963	Graduates of upper secondary schools	1965/66	2	1,160,000	1,160,075	0
Portugal	OECD (MRP)	1960	Enrolments in general, technical and teacher training secondary schools	1964/65	4	296,700	297,252	-0.2%
Spain	OECD (MRP)	1961	Enrolments in general secondary schools (lower, upper and pre-university)	1966/67	5	868,300	929,589	- 7%
		1961	Enrolments in higher education	1966/67	5	92,300	105,370	- 14%
		1961	Graduates of general secondary schools (upper courses)	1966/67	5	49,000	35,700	+ 27%
		1961	Graduates of higher education	1966/67	5	8,900	6,924	+ 22%
Turkey	OECD (MRP)	1963	Enrolments in higher education	1965/66	2	93,900	98,684	- 5%
Yugoslavia	5-year plan, 1966-70	1965	Enrolments in higher education	1967	5	326,000	376,000	- 15%

enrolment ratios of each age group.

59. Forecasts of enrolments in primary schools were based on the assumption of 100 per cent enrolment in the compulsory school age group and, since demographic forecasts for periods of up to 8 years ahead for this age group are based on cohorts already born, the forecasts varied little and the 1967/68 figure suggests that the 100 per cent enrolment ratio target has virtually been reached.

60. However, discrepancies appear in secondary and higher education. In secondary education the figure for 1967/68 and the trend for the preceding two years make it appear very unlikely that the official plan forecasts will be attained. Recent growth in enrolments at this level has been about 2 per cent per annum, whereas to achieve the plan targets during the remaining years of the decade an increase of over 10 per cent per annum would be required. However, these figures for secondary education as a whole conceal the same variations between types of secondary education that are to be found in many of the countries reviewed. In the gymnasias (the more academically oriented secondary schools) enrolments in 1967/68 had already virtually reached the 1970 target levels and had already surpassed by about 8 per cent the forecasts of the first MRP report. In the technical secondary schools, whose main role is to train workers of the technician category, it is clear that neither plan nor MRP forecasts will be fulfilled. Enrolments in 1967/68 were 192,000 and have been declining during recent years. The plan predicts 296,000 for 1970. In higher education the plan forecasts for 1970 had already been surpassed in 1968.

61. In connection with these experiences, Prof. Berislav Sefer writes of the technical difficulties caused by the fact that the "forecasts and plans were elaborated in conditions when the whole economic system was undergoing radical changes. In such circumstances any forecast was bound to be uncertain." It is doubtful if any other O.E.C.D. country has undergone quite such profound political, economic and administrative changes as Yugoslavia since 1960. However, the structure of the educational systems of most Member countries has been evolving rapidly, particularly the key branch of secondary education. As Prof. Sefer remarks, forecasting in such conditions is a particularly hazardous activity. It is, of course, at such a time - when important decisions involving major structural changes are being taken - that forecasts of the likely effects of the changes would be most useful.

62. In Germany, a country with virtually no national responsibilities in the field of education, various official and semi-official agencies have been active in making social demand forecasts. The Academic Council (Wissenschaftsrat) has made forecasts for higher education institutions. The Educational Council (Bildungsrat) has started making forecasts for primary and secondary schools, and the Standing Conference (Ständige Konferenz) has also made important forecasts in all three branches of education. In the number of published

forecasts of enrolments during the past decade, Germany has probably been surpassed only by the United States. This gives rise to the reflection that planning bodies with policy interests, but little administrative or executive power, must concentrate on analytical studies of various kinds and make forecasts. In the years before it became a major spender of Federal Government funds, the U.S. Office of Education was very largely an agency concerned with research and forecasting. This may also help to explain the importance of forecasts by international organisations such as the O.E.C.D. By making reliable forecasts, such organisations can have an influence on policy even though their direct powers are small.

63. This hypothesis may be developed still further since it appears that the work of most of the "planning groups" in national education ministries has been primarily concerned with making forecasts: forecasts of what would happen if certain policy decisions were taken, forecasts of what might happen if certain external events occur, or simply prophecies of what it is claimed will happen. It may be that many planning groups stand in the same relation to the policy departments as do the Academic Council or the Education Council in Germany to the real policy bodies, the Länder. They are interested in policy, but they neither make it nor execute it.

64. In 1963 the Standing Conference of Ministers of Education of the Länder published a comprehensive set of projections for primary and secondary school enrolments. Their purpose was to assess future resource requirements and thus to influence Länder administrations in their provision for education.

65. The main components of the forecasts were demographic trends and estimates of trend changes in enrolment rates.

66. Between 1961 and 1967 enrolments in Gymnasia (academic secondary schools) were expected to increase by 7 per cent. In fact they increased by 32 per cent. During the same period enrolments in Realschule (non-academic secondary schools) were expected to increase by 24 per cent. The actual increase was over 40 per cent.

67. Total enrolments in secondary education thus increased much more rapidly than foreseen. The most striking feature, however, was the extent of the shift towards academic types of secondary education which was the reverse of what was forecast. In attempting to assess why this shift occurred it must be borne in mind that the Gymnasia are the only effective route to higher education.

68. In statistical terms, growth of enrolment ratios in Gymnasias was projected as a linear trend (an extra "x" per cent of the age group enrolled each year), the actual growth appears to have been exponential (the percentage of the age group enrolled has increased by "x" per cent of its previous value per year). The rate of increase in absolute numbers has thus been increasing. However, this is merely an ex-post statistical explanation and gives little indication of how to do better in the future. If one thing is more certain than that a linear trend of proportions of an age group enrolled cannot continue indefinitely, it is that neither can an exponentially increasing curve.

69. A more substantial reason for the inaccuracy of the forecasts, as in France and as in Yugoslavia, is that a number of structural changes have occurred which were not anticipated in the forecasts. In several Länder, entry requirements to the Gymnasias have been eased as part of a campaign to make these schools less socially selective. One aspect of this policy has resulted in Realschule and Gymnasias being built in many rural and mountainous areas where previously there was no opportunity for secondary education. At the same time there has been a vociferous campaign for educational expansion in the press and elsewhere - inspired partly by claims about the importance of education in economic and social development.

70. The only comprehensive attempt at predicting the number of places in higher education was made by the Academic Council in 1960. The criterion was taken that provision should be made for all persons with Abitur qualifications who wished to enter universities. The method was to forecast the number of secondary school-leavers with the relevant qualifications on the basis of trend projections of proportions of the relevant age group with these qualifications. The proportion of those qualified who actually entered university was next projected, and these new entrants were converted to number of places by counting the number of years new entrants needed to equal any given year's student population and calling this the average duration of studies. This then provided a coefficient by which projections of new entrants could be converted to projections of total enrolments. It is interesting that this procedure foreshadows the methods used by the Robbins Committee on Higher Education in Britain.

71. The outcome of the projections was a forecast of a peak of enrolments in 1964 with 240,000 German students (plus about 24,000 foreign students). After this, a slight decline in

numbers was anticipated, corresponding to smaller age groups and a stabilisation of the percentage of the age group qualifying for higher education. In the event, actual enrolment of German students in 1966 was 7 per cent higher than forecast. As compared with some forecasts in other countries, this is not a big discrepancy in view of the big rise in secondary school population; it seems that entry to higher education must have become more restrictive or the average duration of studies must have shortened.

72. Certain of the other recommendations of this important report are worth noting. It was considered that the total number of students who could reasonably be accommodated in existing universities in conditions "compatible with the German university tradition" was 138,000, whereas in 1960 there were already 152,000 students enrolled in these institutions. The creation of several new institutions was, therefore, recommended. Six such institutions were established, but by 1966 the old universities had enrolled 200,000 students, i.e. some 60,000 more than the Council's planners said could be accommodated without changing the character of the universities.

73. It is further interesting to note that enrolments in the technical universities were very close to the forecast figures, thus supplying evidence that in Germany, as in many other O.E.C.D. countries, the unpredicted increase in enrolments was principally in non-technical subjects.

74. It is interesting to compare the methods and subsequent experience of these Academic Council forecasts with those of the British Robbins Committee which were published in 1963. This Report has proved the most influential ever in British higher education - if only because it was the first time a major government committee examined the whole system of higher education. It was an innovation in Britain in 1961, when the Committee was established, to think in terms of a single national system of higher education rather than a heterogeneous collection of colleges and universities, stretching from Oxford and Cambridge at one end, to local technical colleges at the other. The Robbins Committee immediately recognised that whatever their structural, administrative and legal arrangements, these various institutions all formed part of a single "system" of higher education in that they competed for the same qualified school-leavers, teachers and financial resources (the higher education budget of the Central Government) and that their graduates were competing for the same kind of jobs.

75. The Robbins Report is also the first important example in British education of quantitative analysis being used as the principal basis for major policy recommendations. Most of the subsequent forecasts of the Department of Education

and Science, and much subsequent research in higher education, derive ultimately from techniques developed or suggestions made in this Report. These considerations, added to the fact that it appeared about five years ago thus providing a convenient period for initial evaluation, are the reasons why this Report is examined as an example of forecasting in a country where the central authorities have far from complete control over the educational system.

76. As already noted, the Robbins methodology was very similar to that of the German Academic Council 1960 forecast. (1) Briefly there were four steps:

- (i) To estimate the size of the age group relevant to higher education (this was closely related to, but not exactly the same as, the population aged 18). Since virtually the whole of the population who will enter higher education during the Committee's projection period (1961-1981) had already been born, few errors could derive from this source (unless the average age of entry to higher education changes);
- (ii) To estimate the proportion of this age group likely to qualify for entry to higher education. Like the German forecasts these were based on trend projections;
- (iii) To decide what proportion of these qualified school-leavers should be given places. The criterion was that a place in higher education should be available for all qualified applicants and that 65 per cent of these should be universities;
- (iv) To determine from the new entrants the total number of places to provide, by deciding what average lengths of study to assume. The assumption was that lengths of study would remain the same as in the nineteen-fifties.

77. What actually happened has not been exactly the same as either the forecasts or the recommendations. The proportion of the relevant age group to obtain qualifications for entry to higher education has been considerably higher than forecast, with the result that in 1967 (five years after the forecast was made) the number of persons to qualify for higher education was 25 per cent higher than predicted.

(1) For a full evaluation of the Robbins Report see "The Impact of Robbins" by P.R.G. Layard, J. King and C.A. Moser. Penguin Books (London) 1968.

78. It is even more interesting to look at the way these qualified school-leavers have distributed themselves among the different branches of higher education. Having forecast the total number of "qualified" entrants for higher education, the Robbins Committee claimed that it would be undesirable if it became any harder for these qualified school-leavers to enter universities. In practical terms, this meant that the Committee prescribed that 65 per cent of those with the minimum qualifications should have places in universities, the same figure as in 1961. On the basis of these forecasts and criteria, the Robbins Committee arrived at a figure of 197,000 students in British universities in 1968. In the event, there were 200,000, which is remarkably close. The numbers of university students have been equally near to the Robbins figures for each year up to 1968. How has this come about? After all, the number of qualified school-leavers has risen much faster than Robbins forecast. The mechanism was quite simple. After the publication of the Report each university, including the 7 new ones was invited to submit its own plans for expansion in the light of the Robbins proposals. The total of all these independent forecasts far exceeded the Robbins figures. After revising them downwards, therefore, the Government provided the necessary finance. Thus the "independent sector" of higher education complied almost exactly with the Robbins proposals in terms of numbers of students enrolled. It is interesting, however, in the context of forecasting for planning and policy, that no university chose to interpret the Robbins recommendations in terms of the Robbins criteria. No university undertook to see that it became no more competitive for qualified school-leavers to enter, either locally or nationally. No university said "we will guarantee to take 'x' per cent of qualified school-leavers locally or nationally"; nor did the University Grants Committee. The numbers were accepted but not the criteria. As a result, the proportions of qualified school-leavers to enter university, instead of remaining constant at 65 per cent, fell to about 58 per cent.

79. In one area, even the numerical proposals for the provision of places in universities were not implemented. Although it explicitly rejected forecasts of manpower needs as a basis for its proposals (1), the Robbins Committee shared the general view, fostered by the reports of the Scientific Manpower Committee, that there was, and would continue to be, a shortage of highly qualified scientists and engineers. In one of its more difficult and confused passages (2), the Report, having apparently rejected forecasts of manpower needs as a

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- (1) Except in the case of teacher training where the Ministry of Education persuaded the Committee to take manpower needs criteria into account.
 - (2) Robbins Report paras. 505-508.

basis for making proposals, argues that the proportion of students studying science and technology subjects in general should remain constant at the 1961 figure (60 per cent of the total) but that the proportion studying technology should increase. The actual statistical estimates made in the Report implied a constant proportion in science subjects at about 40 per cent of the total, and a rise from 19.5 per cent to 23 per cent for students of technology. What happened in fact was that the proportion of students doing all science subjects decreased from 40 per cent to 36 per cent by 1967, and the number doing technology remained at about 20 per cent. All this occurred in spite of major efforts by the universities to provide an increase in the number of places in science faculties greater than in other subjects. The proportion of pupils in secondary schools following science courses obstinately refused to increase; in so doing, recent evidence suggests that they may have been showing more good sense than their planners and betters. The O.E.C.D. Analytical Report on Gaps in Technology revealed that a far higher proportion of university students are studying science and technology in Britain than in any other O.E.C.D. country.

80. Higher education other than the universities has two main components: teacher training in Colleges of Education, and advanced further education consisting mainly of vocational courses of degree and sub-degree level. These comprise the "public" sector of higher education, being both financed and controlled by the public authorities. In these sectors the Robbins forecasts have been very wide of the mark in terms of numbers of students.

81. In Colleges of Education the situation was complicated by the publication in 1965, after the Robbins Report, of the Ninth Report of the National Advisory Council on the Training and Supply of Teachers. This forecast a continuing shortage of primary and secondary school teachers. At the same time the debate about efficiency in the allocation of resources was beginning and suggestions were made that one of the most wasteful aspects of higher education was the extent to which physical plant was under-utilised. The Minister of Education, accordingly, asked Colleges of Education to prepare plans for using their buildings to house 20 per cent more students than originally planned. Their recurrent finance was adjusted so that the staff/student ratio could be maintained. The Colleges of Education complied with these instructions, made their plans and implemented them. The net result was that by the academic year 1967/68 there were 106,000 students in Colleges of Education rather than the 84,000 recommended by Robbins.

(1) A recent article supports this view. See "The Scientific Manpower Committee - Case Study of a Science Lobby" by M. Blaug and K. Gannicott: Higher Education Review Autumn 1969.

82. In further education the proportionate discrepancy was even greater. Instead of the 47,000 full-time students in advanced further education recommended by Robbins, there were by 1967/68 over 71,000. Since 1945 this sector has acted as a safety valve for higher education, relieving the pressure of the demand when it could not be satisfied by other sectors. Full-time advanced further education is provided in colleges which have a high proportion of part-time students and also many students doing non-advanced work. This has meant that it has been relatively easy to concentrate the increase in resources on full-time advanced courses. The colleges have been anxious to do this since a high proportion of full-time advanced students means high prestige. At the same time it has become relatively easier for students to obtain maintenance and study grants to attend advanced further education courses. The situation is now such that further education colleges will accept virtually any student with two 'A' level passes in his G.C.E., and all such students can receive a Government maintenance grant to permit them to continue their studies.

83. In summary, the situation has been as follows: the number of qualified school-leavers has increased considerably more rapidly than Robbins forecast. A large part of the students comprising the discrepancy has been pushed towards advanced further education; the last remaining financial disincentives have been removed with the liberal provision of grants. The colleges themselves have needed no encouragement to concentrate on full-time advanced courses rather than part-time and non-advanced courses. Thus, the public sector of higher education has been doing its best to live up to the Robbins criterion, rather than the Robbins numbers - i.e. that places in higher education should be available to all who were qualified and who wanted them. Another factor which probably helped the Technical Colleges shift their resources towards the advanced courses has been the rising trend of secondary school children to stay on in ordinary secondary schools. This has reduced the demand for non-advanced further education.

Social Demand Forecasts - General Considerations

84. It is not the primary purpose of the present paper to examine methodological issues, but enrolment forecasts have proved so consistently "wrong" that the study of their logical basis is itself virtually a policy issue.

85. The reasoning behind the use of trend projections of enrolment ratios is quite straightforward, although interestingly enough it has seldom been made explicit. It is assumed that at any point in time a certain proportion of each age group of boys and girls have the "propensity" to be in school. This propensity is a combination of ability to pursue courses at the level of education in question and desire to do so. Since enrolment ratios have increased for several decades, this propensity to be in school is assumed to increase with time.

86. It is not at all clear, however, that the enrolment ratio of any age group measured at any particular point in time is a very good measure of the propensity to be in school or the "social demand" for education by persons in that age group at that point in time. If there were empty places available in all or most education institutions it would be true. (1) It might be true also if the structure of the system was such that the number of places available responded immediately to an increase in demand. In fact in no O.E.C.D. country has there been any significant number of unfilled places in any branch of education, and without empty places it is virtually impossible for the system to respond instantly to any increase in demand. Many of the educational systems in O.E.C.D. countries do respond to a change in the pressure of demand for places after a time-lag, but this time-lag creates quite a different pattern of system behaviour, which is commented on below. As it is, observations of the number of students in any branch of education gives virtually no indication of the current state of social demand, much less a basis for projecting it into the future.

87. The situation is, however, even more complicated. Many children are influenced in their desire to enter academic secondary education by their estimates of their chances of finding places in higher education, and having the economic possibility of maintaining themselves while they are there. In many countries it is quite clear that in the past many working class children have not been enthusiastic about pursuing secondary school courses leading to university entry because they did not think they had a chance of getting into university or of maintaining themselves if they did get there. Thus, their years in secondary education would be largely wasted - especially when, as in most countries, there is a parallel non-academic vocational stream which does not lead to university.

88. This begins to give us a model to explain why "social demand" projections have so consistently underestimated the growth in enrolments. In the first place, there was during the nineteen-fifties an increase in the desire to take advantage of educational opportunities. This meant that there was constant pressure on the number of places available. This pressure for places coincided with a growing political and social belief in equality of educational opportunities which it was assumed expansion would bring about. Accordingly, attempts were made to provide sufficient places to satisfy the demand. A variety of sophisticated methods of time-series analysis has been used to estimate the extent of this growing demand; which all amount in essence to the projection of

(1) In fact this criterion is slightly too strong in higher education, since many universities have students from all over the country and are close substitutes for one another. It is true in secondary schools which are for the most part specific to one geographic location. Vacancies in one area cannot be readily filled from elsewhere.

enrolment ratios. However, this in effect simply meant a projection of the number of places that happened to have been available during the preceding few years. The fact that it was enrolment ratios rather than enrolments that were projected gives another reason for underestimation. Most of the projections took place in the aftermath of a rapid rise in the birth rate. In such a period, if the effective constraint on expansion was supply rather than demand, this would mean that enrolment ratios rose less rapidly than true "demand" was increasing.

89. Thus the forecasts were made, and were often acted upon in the sense that extra resources were provided. The effect was rather like removing the cork from a champagne bottle. As more places became available more children realised that it was worth their while trying to reach the upper levels of secondary and higher education. The doctrine of promoting educational opportunity meant that more pupils were squeezed into available places. There was, for example, virtually no "improvement" in pupil/teacher ratios in the upper branches of education in most countries during the period. The more places that were created to alleviate the new overcrowding, the more this stimulated further increases in demand, which in turn caused further overcrowding. The general lesson is that much more explicit account needs to be taken of the interaction of demand for places and the number of places available, and the effect of time-lags in constructing forecasting models.

90. The situation was worsened by a belief, usually implicit but sometimes made explicit (1), that, in some sense, children's desire for higher education would be influenced by their desire for suitable occupations, just sufficiently and with the proper time-lags, to bring about a balance between economic demand for qualified manpower and the supply coming forth. If enrolments expanded faster than the demand for qualified manpower, this would act as a brake on supply as the "rate of return" in that branch of education declined. However, another possible economic mechanism is the dilemma of the advertiser. Such a mechanism would postulate that at any point in time there are a fixed number of high-status jobs. A necessary but not sufficient condition for obtaining one of these jobs is the holding of an educational qualification. The attraction of the chance of such a job, in a period of expanding educational opportunity, stimulates more qualified persons than there are appropriate posts available. Some of these qualified people take posts one step lower in the occupation/status/salary hierarchy, thus depriving persons with lower educational qualifications of opportunities for which their education would previously have been considered sufficient. They, in turn, must either acquire more education, or, in turn, move down

(1) See for example "Targets for Education in Europe in 1970" in Policy Conference on Economic Growth and Investment in Education (O.E.C.D. 1962).

the occupational ladder. Since public subsidy makes the private cost of education much lower than its real cost, many students at each stage will prefer more education, a desire that becomes more and more intense. This hypothesis is difficult to test conclusively, but it provides a plausible explanation of the continuing existence of unemployed graduates in some Member countries. It may also be a factor in the continually increasing demand for education, even in the United States where unemployment rates are negatively correlated with the number of years of education attained.

91. The next few years may well see an attack on the whole philosophy of the social demand approach on the grounds that it leads to a misallocation of national resources and over-investment in education. More importantly, however, it can be claimed that it is misleading to encourage students to acquire more and more education in the expectation that their "rates of return" on investment in themselves will be similar to those obtained by similarly educated people when education was not nearly so widespread. Only time will tell whether the very rapid enrolment expansions in secondary and higher education of the past decade will result in a serious decline in the earnings associated with educational qualifications in relation to the cost (including income foregone) of acquiring that education.

92. Educational forecasters are not alone in underestimating demand. Urban traffic planners have similar problems. The more roads that are built, the more people prefer to use private cars instead of public transport for their journeys to the city centre. As in educational planning, they are plagued by the problem that the more roads they build the more traffic jams they have.

93. Despite all these considerations, it would be wrong to conclude that forecasts have had no effect. Without forecasts it is possible that the actual expansion would have been considerably less, since expectations of students would have risen much more slowly. The final section of the paper considers in general terms the role of forecasts in educational planning and policy-making in the light of the experiences described here, which may be considered representative of many other C.E.C.D. countries.

MANPOWER FORECASTS

94. Several comprehensive evaluations of manpower forecasting exist. The C.E.C.D. has published its own in A Technical Evaluation of the Mediterranean Regional Project, by R.G.Hollister (1967) and in Background Study No. 8 of the present Conference on "Educational Planning Methods". An analytical review of the French experience was published in Population (INED, Paris, February 1970). U.K. work in manpower planning was reviewed and heavily criticised by Blaug and Gannicott in Higher Education Review (London, Autumn 1969). Blaug and Gannicott's study is part of a general evaluation of manpower forecasting in many

countries being undertaken by the Higher Education Research Unit of the London School of Economics. The comments in this paper rely heavily on these various studies.

95. One of the problems in evaluating manpower forecasts is that they are not nearly so readily comparable with actual outcomes as social demand forecasts. Partly this is because practical manpower statistics appear at infrequent intervals and few were made sufficiently long ago to be able to compare the forecasts with actual outcomes. Partly, however, it is because the nature of most manpower forecasts is such that they have been made conditional upon a large number of exogenous economic circumstances which have rarely turned out as predicted.

96. One of the paradoxes of the so-called "manpower approach" to educational planning is that despite its great prominence in the literature there have been relatively few examples of educational decisions being based on manpower criteria. For the most part manpower forecasters have tended to reinforce the recommendations of the protagonists of the social demand approach by showing the need for more people with nearly all kinds of educational qualifications. To this extent, many manpower forecasts have been readily accepted by public opinion and by policy-makers. They have not fared so well where they have conflicted with social demand. One notable example is the well-known forecasts by Hajo Riese in Germany. (1) Riese suggested in 1967 that little further expansion of German higher education was required before 1980 on manpower grounds. As may be imagined, such a projection proved rather controversial and Riese's methods and conclusions were subjected to severe criticism. However, they have had the effect of stimulating interest in the manpower approach in Germany, and the Science Council is currently engaged in a major debate as to whether this is an appropriate criterion for deciding higher education policy. There is, however, little evidence that so far manpower considerations have had any substantial influence in any branch of German higher education.

97. A more general example of what happens when manpower forecasts conflict with social demand is given by the case of secondary level scientific and technical education. Most manpower forecasts in most countries have agreed that the critical shortage is of scientific and technical manpower, particularly at upper secondary and post-secondary levels below the highest. In fact, in very many cases children in secondary schools have shown increasing reluctance to study scientific and technical subjects. This has happened even when, as in Grammar Schools in England and Wales, science has parity of esteem with more traditional subjects. The

(1) Die Entwicklung des Bedarfs an Hochschulabsolventen in der Bundesrepublik Deutschland, 1967.

reluctance of children is even greater for many technical subjects which are taught in special types of school parallel to the main stream of secondary education. As was shown in the section on social demand forecasting, secondary technical education has in nearly all cases failed to expand as rapidly as projected. Partly this is no doubt due to the fact that in most countries secondary technical schools do not provide an easy route to higher education.

98. In 1961, the British Committee on Scientific Resources predicted a surplus of many types of qualified scientists and engineers by the mid-1960's. By this time opinion generally had convinced itself of the reverse, and the projection was first ridiculed and then quietly ignored. The increasing "brain drain" from Britain in the mid-1960's suggests that the projection may not have been entirely wrong. Three years later, the Committee, using rather different methods and different definitions of qualified manpower, was projecting a shortage of scientists and engineers. Subsequent reports again stressed the shortage. It was after a spate of these reports in 1967 that the University Grants Committee decided to accede to popular demand by students for greater emphasis in places in non-science subjects in universities. This does not suggest that manpower forecasts were very influential when they conflicted with manifest social demand.

99. It has already been mentioned that manpower forecasts of the 1960's usually indicated the need for substantial increases in the output of persons from most branches of the educational system. Their general recommendations have thus been rather readily accepted in a period of social pressure for educational expansion, since this gives an economic justification for the expenditure of resources. In addition, however, the rapid expansion of the educational system has itself generated a very considerable demand for its own products in the form of teachers. The forecasts have thus proved self-fulfilling in a rather peculiar way, as can best be shown by a concrete example. Assume a decision to increase the output of specialists in some subject in response to a projected manpower shortage. If the policy is successful there will be an immediate need for more teachers in that subject. Initially these teachers can only be obtained by reducing the supply to other economic sectors, perhaps by bidding up the price and thus raising the "rate of return" to that branch of education and making a manpower shortage apparent. It is only after the educational system has adjusted itself to the new situation that it will be possible to assess whether the initially projected shortage was real or imagined. The mechanism is somewhat similar to that in agriculture where the immediate response to an increased demand for, say, beef, is a reduction in supply, as farmers build up their breeding herds. All of which means that if manpower forecasting models are to be useful they need to be much more sophisticated than heretofore, taking time-lags explicitly into account.

100. One of the basic assumptions of manpower forecasting has come under heavy criticism in recent months. All manpower forecasts depend on a certain consistency in some of the key manpower coefficients. These coefficients can be expressed in a wide variety of ways - number of persons with qualification "x" per unit of output, proportion of the labour force with qualification "x" in industry "y", and so on. However, they have all been based on the idea that there is some stability in these coefficients (which is not inconsistent with regular changes through time, or as output changes) and that there is a high degree of complementarity between different types of qualified manpower in the labour force, and between qualified manpower and capital stock. Recent evidence collected by the O.E.C.D. secretariat (1) does not support this type of hypothesis. There are wide differences in the manpower structure of different countries which cannot be adequately accounted for in terms of either the level or the pattern of output. At the other end of the economic spectrum, a study by the London School of Economics Higher Education Research Unit of 80 firms in the electrical engineering industry yields similar results. (2) In Britain at least, manpower structures in this industry are not significantly related to any important economic variable. Other evidence pointing to similar conclusions is presented for France by Claude Vimont in Population, February 1970 (op.cit.)

IV. EDUCATIONAL PLANNING AND POLICY - SOME SUGGESTIONS FOR THE SEVENTIES

101. This paper has concentrated largely on forecasts of enrolments and the administrative machinery and mechanisms by which they are made. It could equally have examined the methods by which the estimates of student numbers have been converted into resource needs, expenditures, teachers, buildings, equipment. However, this would have made the paper unmanageably long and would have revealed methodologies even more crude than those that have been described. Average staff/student ratios and average expenditures per pupil have been the usual method by which estimates of future numbers of students have been converted into resource needs.

102. In secondary and higher education, enrolments have nearly always been higher than forecast, often very much higher. This has meant either that provision of teacher and other resources has risen less fast than the number of students

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- (1) Statistics of the Occupational and Educational Structure of the Labour Force in 53 Countries (OECD 1969) and analysed in "Occupational and Educational Structures of the Labour Force and Levels of Economic Development" (OECD 1969 - DAS/EID/69.16).
 - (2) To be published in 1970 by Allen Lane (London)

or that expenditure has been higher than forecast. Governments have had a choice of, themselves, restricting student numbers to the level indicated in the forecasts, of lowering the quality of provision of facilities, or of tying themselves to unknown, open-ended commitments.

103. What are the lessons of all this for the next decade?

104. The first is that forecasts, whether of "social" or individual demand for places or of manpower needs, have proved almost invariably wrong. The assumption must be that forecasts will continue to be wrong, and the correct question is how the planner should behave in a situation in which the one thing he knows about any forecast he makes of the likely future course of events is that it will prove to be wrong. The second is that much more emphasis needs to be placed on planning the efficient allocation of resources in education.

105. Four desirable developments may be discussed briefly:

- (i) Better understanding of the system.
- (ii) Continuous revision of forecasts.
- (iii) Assessing the implications of possible policy decisions.
- (iv) Establishing the system as a self-regulating adaptive control mechanism.

106. These are not competitive approaches; rather they supplement one another and should be looked at as an interrelated sequence of planning activities, where the earlier steps must precede the later ones but the later ones do not supersede the earlier ones. For example, the establishment of a self-regulating educational system which adapts itself in accordance with national policy needs is not possible before the implications of alternative policies have been worked out. However, the achievement of this stage does not supplant the need for a continuous assessment of possible policy decisions.

(i) Better understanding of the system

107. Nearly all the forecasts of enrolments of the past decade have been, in the last analysis, projections of trends. In other words enrolments, enrolment ratios, productivity and all the other variables considered, have been treated ultimately as functions of time, and functions of time only. Usually they have been treated as linear functions of time, and some of the critics of the forecasts have suggested that more reliable forecasts would have been obtained if various types of non-linear functions had been fitted. This misses the point. Even if during the period 1960-1969 a logarithmic trend or a logistic curve fits a certain set of data better, in some sense, than a linear trend, this is no guarantee that it will continue

to be the case in the future unless we have a substantiated hypothesis about the mechanism behind the trend.

108. It would be over simplifying to suggest that educational planners and policy-makers are unaware that a vast complex of factors are interacting to cause enrolments in any particular educational activity to be what they are. Numerous reports in many countries have shown that pupils' achievement, and hence the number of qualified school-leavers of various kinds, are influenced by a whole host of variables. Among them are: innate ability, family income, parents' occupation, social status and education, employment prospects for school-leavers with different qualifications, attitudes towards careers for women, the structure of secondary education, the supply and quality of teachers and other resources, the availability of scholarships and other financial incentives, attitudes of peer groups and so on.

109. Virtually none of this has been put together in any fully comprehensive forecasting model. The reasons are not hard to find. First, it is an extremely complex technical task to piece together statistics on all these factors (each of which involves complex distributed time-lags) into a single coherent forecasting model; secondly, the available data in no country would permit the reliable estimation of the parameters of such a model even if it could be constructed. This means continued efforts at improving data collection, processing and analysis, which will be expensive.

(ii) Continuous revision of forecasts

110. Even if all the factors influencing the development of the educational system are fully understood and accurately measured, it is still most unlikely that long-term forecasts would have a high degree of accuracy. The reason is that some of the factors influencing enrolment - particularly the economic ones - are exogenous and themselves subject to uncertainty.

111. The solution to this problem is not the continued refinement of one particular set of data. Apart from the fact that refinement of the analysis of a particular set of data beyond a certain point is subject to sharply diminishing returns, the main purpose of forecasts is to aid decision-making, and few educational decisions can be postponed indefinitely while forecasts are infinitely refined. Fortunately, this is not necessary because the extent of the decisions that can be taken in any particular year is clearly finite. This means that the amount of damage that can be done by acting on incorrect forecasts in any one time-period is severely limited, provided that the forecast is adjusted in the next time-period and that that period's decisions are taken on the basis of the adjusted forecasts and the decisions actually taken in the previous time-period.

112. In Britain, for example, forecasts of children in primary school are made every year for each year of a period 25 years ahead. These are used as a basis for decisions about teacher training and provision of long-term physical capital - mainly buildings. However, the number of teachers trained or buildings built in any one year is a very small part of the total stock, or of those that will be provided during the 25-year period. If, therefore, the 1969 forecasts suggested that those made in 1968 erred on the low side, no irrevocable damage would be done if the 1969 decisions took account of this fact.

113. The problem with many of the forecasts of the past decade is that they have been once-and-for-all efforts, or repeated at infrequent intervals. This has meant that forecasts have continued to be used as a basis for policy decisions long after they have proved to be inaccurate. In most of the Mediterranean countries, for example, the MRP forecasts are still the most up-to-date available.

114. The establishment of planning machinery which is capable of such rolling forecasting requires the investment of much greater resources than has hitherto been the case in most countries.

(iii) Assessing the implications of possible policy decisions

115. The next stage in the development of planning is to concentrate on estimating the likely effects of possible decisions that may be made. One common feature of all the forecasts considered in this report is the extent to which they were made with little consideration of possible or likely policy decisions during the period of the forecasts.

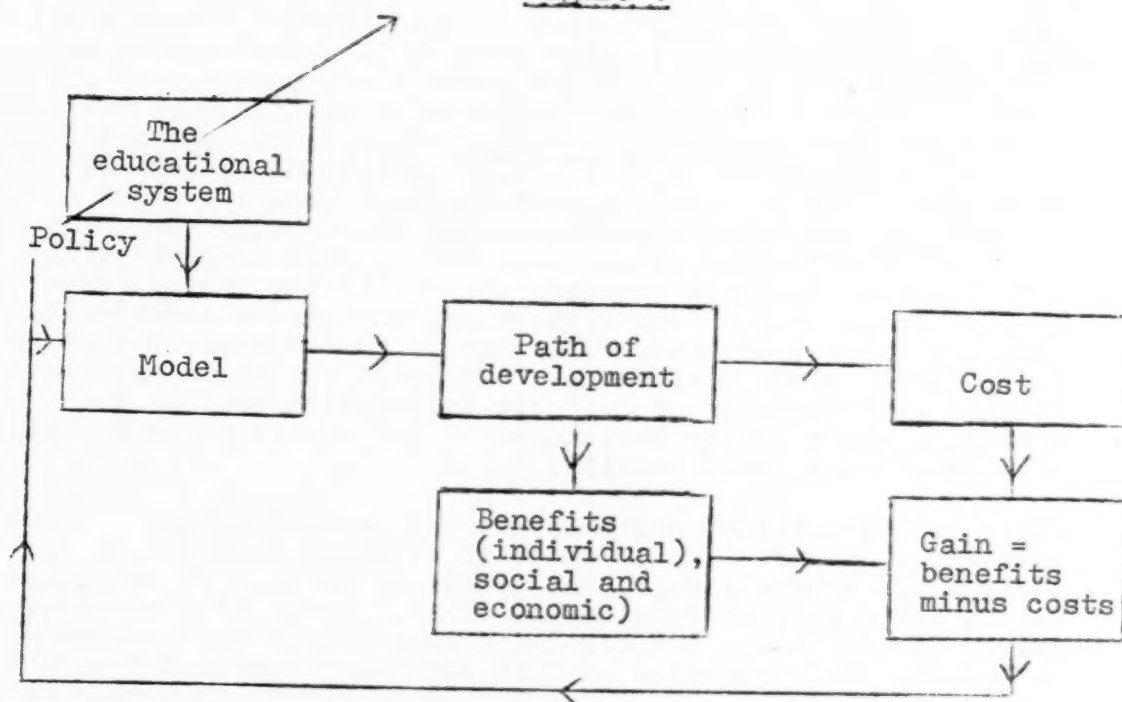
116. Probably the biggest single weakness of educational planning to date is that planners have addressed themselves to the wrong questions. On the one hand, they have attempted to make unconditional forecasts assuming no intervention on the part of policy-makers; on the other, they have suggested unique solutions to policy problems. A strong case can be made that the role of the technical planner should be criticism and evaluation of proposed policies and not the formulation of policy. At any point in time the educational policy-maker has a very large number of possible decisions he can take. It is wishful-thinking to suggest that there is any scientific way of arriving at a best decision satisfying all the criteria the policy-maker may have in mind. What is more realistic is for the policy-maker to propose a course of action and then ask the planning body to evaluate the implications of this course of action.

117. Having set up a system of equations to describe all the factors involved, the planner will discover that he has very little data on which to estimate the parameters of his model. This is because the decision to be taken has no exact historical parallel. Any a priori attempts to assess the effects of the decision will always contain an element of guesswork. It is vital, therefore, that when any major educational decision is taken, or new policy adopted, an information system is established at the same time, capable of collecting the data necessary to see if the new policy is having its desired effect without any unwanted side-effects. When set out rather abstractly, the point seems so obvious as to be hardly worth mentioning. In practice, it is very rare for the establishment of suitable information systems to accompany major policy decisions. The result is that policies often have unexpected results.

118. A simplified and conventional version of the problem is shown in Figure 1. In order to find the best policy to control the system itself, the model can be used to calculate the expected path of development of the system if a particular policy is adopted. The costs and benefits of this course of action are then evaluated so that the gains associated with the policy are known. The aim would be to survey the whole field of possible action to find the policy which maximised the gain. This policy would then be put into practice, i.e. applied to the educational system itself. This is the orthodox cost-benefit approach.

119. Four key features of this conception of Figure 1 are:

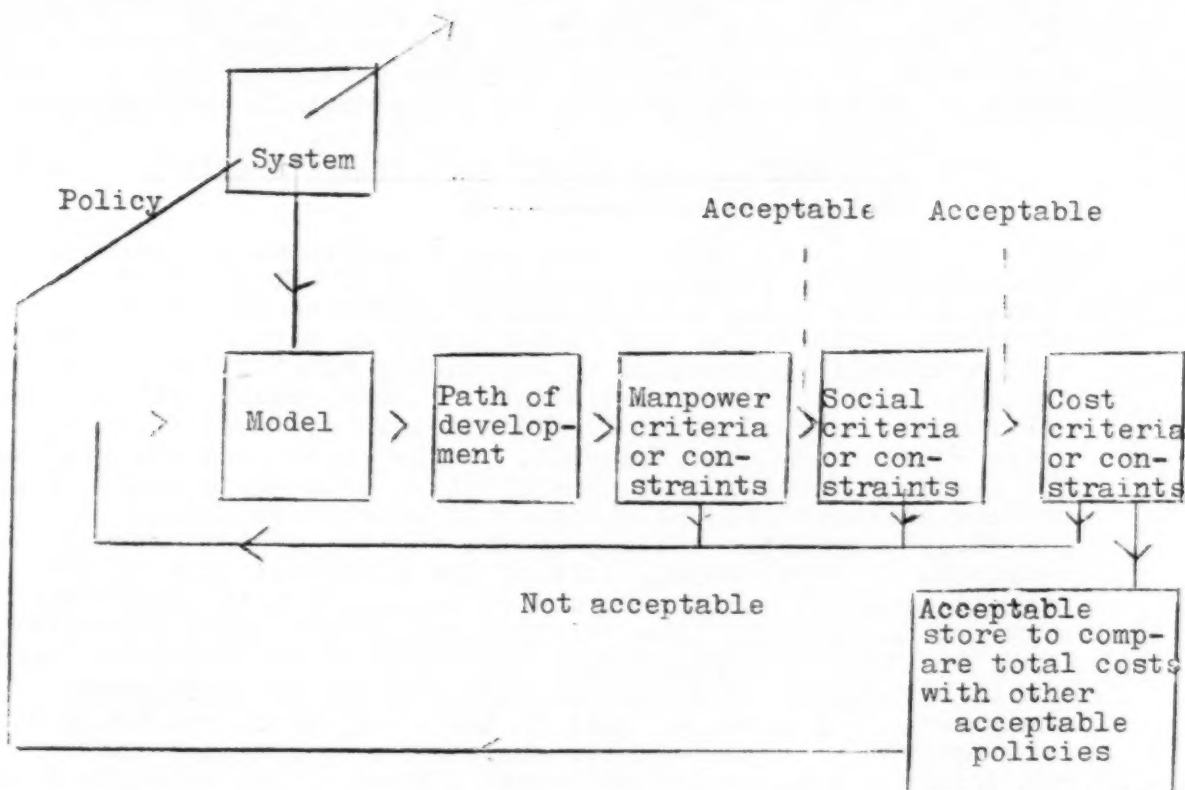
- (a) the role of the model in computing the expected outcome;
- (b) the definition of costs;
- (c) the definition of benefits; and
- (d) the reconciliation of costs and benefits in the definition of the objective.

Figure 1

120. Three main lines of research are suggested by this way of looking at the problem.

- (a) It is necessary to maintain and develop the model;
- (b) The second area of study is costs, so that the model can be made more explicitly relevant to the policy choices which have to be made;
- (c) The work, described under the two headings above, must be integrated in an attack on the practical problems of resource allocation. This is the most important but also the most difficult area for research. The simple cost-benefit approach, implicit in the formulation of Figure 1, is almost certainly bound to be impractical or insufficient, for there are serious shortcomings in this conceptualisation. In Figure 1 it is taken for granted that the various forms of benefits can be quantified and that they are, or can be made, additive among themselves and with costs. Efforts need to be made to define more precisely all forms of benefit, but the controversy between advocates of the "social demand" and "manpower demand" schools, and the multi-dimensionality of benefits, suggest that progress will stop short of a complete synthesis of the various aspects. If this proves to be the case, each viewpoint will have to be considered separately and in sequence. It is useful to think in terms of revising Figure 1 as in Figure 2.

Figure 2



121. As before, the model would show the possible paths of development for the system, but each outcome would be subject to several stages of scrutiny. The output from the system would be assessed in terms of its manpower implications, and checked against any predetermined criteria or constraints, e.g. it might be felt that the output of, say, doctors, should not fall below some absolute number or some fraction of the existing stock of doctors. If the projected path of development did not meet this manpower constraint, this suggested policy would be eliminated and another sought. If the suggested policy were acceptable from a manpower point of view, it would then be subject to assessment on social policy terms. In a similar manner, it would be tested against criteria such as whether "y" per cent of the age cohort was entering higher education or "z" per cent were graduating. Again, the policy might be unacceptable and, therefore, eliminated at this stage. If acceptable from the social point of view, the path of development would be checked for costs, where it could again be eliminated if it failed to satisfy (cost) criteria. Any policies surviving

all these stages would be retained as feasible courses of action. It might be satisfactory to choose the feasible policy with the least cost, but it would also be necessary to examine the sensitivity of policies to slight variations in constraints. Such a sensitivity analysis would be particularly important if a first search failed to find a viable policy and, in any case, would be particularly valuable in its practical implications.

(iv) Establishing the system as a self-regulating adaptive control mechanism

122. The final step in relating educational forecasting realistically to planning and policy is to establish the system in such a way that it adapts itself to change in accordance with social and economic needs, rather in the way that a biological organism is constantly adapting itself to changing environmental conditions. Many educational policy-makers have reacted strongly against this approach in recent years - with some justification. They have been deterred by the abstract formalism of some of the models put forward, the complex mathematical presentation of which often conceals extremely simplistic notions of the way the system actually operates. Furthermore, much of the published work on the subject draws rather too freely on analogies with engineering systems, using terms like "control variables" which educationalists find objectionable. Social systems such as education have a far higher degree of tolerance than a piece of engineering equipment. A piece of grit in the wrong place can bring a motor-car to a complete halt, whereas an educational system can tolerate quite a lot of "grit" without going completely off the rails.

123. Nonetheless, this is the approach to educational planning which should be the ultimate aim of planners. It cannot be achieved until all the previous three steps have been successfully undertaken since, until that time, policy-makers will not know what interventions are necessary in order that the system will regulate itself in a socially desirable way.

124. The critical points in the establishment of such a system are, first, to generate the right kind of information about the system's operations; second, to ensure that this information is available to all those, including parents and children, whose decisions significantly affect the operation of the system; and, third, to ensure that the structure of the system is such that the individual's response to the information he receives is in accordance with the welfare of society as a whole.

125. It has to be admitted that all countries are still a very long way from such a smoothly operating self-regulating system. It must also be admitted that the four steps outlined above will require vastly greater resources devoted to

educational planning than has been the case in the past decade.

126. However, the lesson of this paper has been that without an approach on this scale most of the effort devoted to forecasting is wasted. It is simply not worthwhile devoting more and more effort simply to refining statistical projection techniques. What is required is a substantial change of emphasis, backed by adequate resources. To continue with the methods which have so far proved worthless is like trying to reach the moon with a firework because it starts off in the right direction. Rocketry alone, without complex information and control systems, is virtually useless.

Concluding Remarks on Objectives

127. However, before any of these planning techniques on systems can be developed usefully, it is necessary to give some further thought to the objectives of education. No planning, however sophisticated, is very useful if it is directed at objectives that are bad or irrelevant. A complex system such as education has many objectives, major and minor. However, it is usually possible to summarise most of them under a few headings. It was suggested earlier that the principal objectives of the past decade were expansion, equalisation of opportunity, making education relevant to the manpower needs of the economy and reducing costs. It was suggested that only on the first of these can full success be said to have been achieved in most countries.

128. On the basis of past experience and the current educational situation in many O.E.C.D. countries, the following seem to be the most important questions educational policy-makers of the nineteen-seventies will have to face:

- (i) Should educational expansion continue to be governed largely by individual demand for places?
- (ii) How can increased efficiency be achieved without causing excessive resentment from educationalists claiming that such attempts are attacks on educational standards?
- (iii) Is there any danger of unemployed graduates in some subjects becoming a problem in O.E.C.D. countries, particularly with the very rapid expansion of general studies in secondary schools and social studies in higher education?
- (iv) How can equality of opportunity be achieved, as opposed to being merely a professed objective of educational policy?

- (v) Is it desirable to take steps to bring social rates of return to education into line with private rates of return. If so, what steps?
- (vi) Is it desirable to try to increase funds available for education other than from the central government budget?

129. It has often been claimed in recent years, echoing the famous dictum of von Clausewitz, that "education is too important to be left to the educationalists". Unless economists, planners and statisticians show themselves more aware of the complex problems of an educational system, there is more than a remote possibility of a counter slogan that education is too complicated to trust to the planners and a revolt against increasing state involvement in education. The result could be disastrous for the millions of educational "have-nots" who remain in all O.E.C.D. countries. It could be equally disastrous for their economies.